

# **A GENTLE INTRODUCTION TO SOUTH INDIAN CLASSICAL (KARNATIC) MUSIC**

## **PART I of IV**

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### **WHAT IS THE FOCUS OF THIS PRIMER?**

Many of us have grown up in India, where we were exposed to Indian classical music in one form or another. However, if you are not from a musically inclined family, the odds are that you perceived classical music to be something esoteric that only a selected few could understand and appreciate. An occasional devotional song or a 'classically tuned' film song would have made you stop and take note. Your curiosity could have been aroused. But, you may have quickly ignored the instinct and made a beeline for the usual pursuits in life. Even if you were interested enough to find out about classical music, you did not know what books to read or who to talk to. Even if you managed to talk to someone, it is likely that the person made you feel inadequate about your lack of musical abilities or proceeded to give you a long lecture about music with a million buzzwords that confused you and weaned you off your curiosity. It is unfortunate that there is an almost total lack of simple, readable, introductory texts on Indian classical music, especially when compared to volumes and volumes of elementary books available on Western Classical music. No wonder an average college-educated person in the USA is at least mildly knowledgeable about Western classical music whereas an average Indian is by and large ignorant about the technicalities of Indian classical music. This primer is a feeble attempt to introduce Karnatic music in a gentle way, in a language presumably we

all can understand. I want to be able to rekindle your interest and help you discover some of the 'method' and grammar of Karnatic music. Even though these notes are aimed at introducing Karnatic music, a lot of what I have to say also apply to Hindustani Classical music.

This primer is obviously not meant for experts. I have intentionally kept this text simple. The idea is to introduce the richness of Karnatic music and not to write an encyclopedia. Some of what I will be saying may not be entirely accurate, but the simplicity is more important than dictionary definition of terms. This primer is only intended to get you started and once you are on your own, there are many, many texts you can refer to for all kinds of information. These notes are also not meant to be complete, because I will be using only a minimum of technical terms. I won't even attempt to discuss the 'vaadhi-vivaadhi -samvaadhi' kind of technicalities and lose my reader.

So, lets get started!

## **SOUND AND MUSIC**

Music is an extremely subjective, aural experience. Some sounds are perceived by us as pleasant and some others as unpleasant. What is considered pleasant or unpleasant can be quite personal, based on our specific culture, exposure to particular kinds of music and perhaps even on what our parents told us. A song could be a major hit in one country and could be completely disliked and ignored in some other country. Our musical tastes are indeed developed. As we grow up, and discover music from other cultures or newer musical styles, our tastes too change. Sometimes, we even discover a pleasant piece of music purely by accident - because it simply happened to resonate with our inner sensibilities. Oh, nothing like self discovery !

So how do we make sense of sound and music ? Let us try to answer this by examining some simple concepts first. Our high school physics tells us that sound has several features - such as pitch, intensity, quality and duration. The pitch is just the frequency of the sound vibration - given in hertz or cycles. The musical term for frequency is 'tone'. The audible frequency range extends from about 25 Hz to around eight or ten thousand hertz, although it depends entirely on the individual. Children can hear much higher frequencies. At the lower end of the range, even if we may not 'hear' ultralow frequencies, we may 'feel' the vibrations as a tactile sensation.

The intensity is the same as loudness and it is related to the amplitude of the sound wave. One should learn to not confuse the intensity with the frequency. For example, try to recite the nursery rhyme 'Baa baa black sheep, Have you any wool ?' When you come to the syllable 'bl' in the phrase 'black sheep' (or 'woo' in the word 'wool') you are hitting a higher 'tone' compared to 'Baa baa'. This is the effect of frequency. Now, you can either whisper this nursery rhyme or shout your guts out. In each case, you are simply changing the intensity.

The other attribute of sound - duration - is self-explanatory. It is simply the time during which the specific frequency or 'tone' lasts. The term 'quality' is more difficult to understand. It is simply a signature of the source of the sound. It is a term which explains why a violin sounds like a violin and a drum sounds like a drum. This attribute is precisely the reason you can make out your mother's voice over the phone even if she has a horrible cold. The bottomline is, when you or an instrument produce sound, you not only produce one frequency, but also produce a spectrum consisting of several 'overtones'. This is variously referred to as 'timbre' or 'tone color'. This constitutes the 'Quality' of that sound.

Just to explain this concept some more, let us say you try to produce a single frequency with your voice - one way to 'produce' a single frequency is to get a keyboard and keep pressing one of its keys and you hum along till you resonate. If you actually analyzed the waveform you produced, you will see not only a significant amount of the frequency you were trying to produce but also see small amounts of other frequencies - which are the overtones. The exact composition of overtones you produced is in some sense the signature of your voice and constitutes its quality.

This should also set you thinking. Just how in the world do you perceive sounds ? How do you identify your friend's voice ? Clearly you are not decomposing it into frequency components (Fourier analysis). How do you sometimes make out which song it is simply by listening to a few notes ? How is it that you can mentally 'visualize' (!) someone's voice, laughter, sounds, some past conversations, songs ? Basically, when you hear sounds and music, you are simply doing a 'pattern recognition' against what you already know. Over the years, your brain has stored a certain number of 'primitives' - this list is a dynamic one and primitives are added or lost as you grow older - and you have an intrinsic capability to match a freshly heard sound impulse to the basic database. If you hear a strange sound that does not produce a match, sometimes you load it up as a primitive.

An equally interesting exercise - think of five songs you really like. Can you explain why you like them or what is in common with all of them ? Can you 'explain' and define your musical taste ? Unfortunately, however much analysis one does, in terms of frequencies and so forth, it finally boils down to psychological factors when it comes to music and taste. Analysis is merely a tool to understand some of its structure. It can never explain why some musical sounds are deemed 'romantic' or 'harsh' or why some Ragam is an evening Ragam (if you believe in such things). Such mystique about music will come back to haunt us and will forever prevent us from understanding its totality in an objective manner.

This is just a simple stab at the psychology of sound perception. Let us get back to the business on hand!

## **WESTERN MUSIC, INDIAN MUSIC AND THE KEYBOARD**

Let us examine the frequency aspect of music first. This is perhaps the most studied aspect as well. We mentioned that all music is produced in the audible frequency range, a range which varies from person to person. Although human ears cannot tell very high 'tones', musical instruments can produce frequencies (overtones) even beyond the threshold of human hearing. Music is sometimes described technically as 'tonal' or 'chromatic', both terms simply mean that we use a whole spectrum of frequencies to produce music.

The audible range is divided into 'octaves'. An octave is really a frequency range from a frequency  $f_1$  to  $f_2$  such that  $f_2$  is twice that of  $f_1$  in terms of cycles or hertz. For some physiological reason, the human ear is logarithmic and is sensitive to frequency octaves. The audible frequency is then comprised of many, many octaves. We can choose any number to be our  $f_1$  (and  $f_2$  of course is 2 times  $f_1$ ) - we can define an octave from 10 Hz to 20 Hz or equally well another one, say from 15 Hz to 30 Hz.

In terms of sound production, a typical human voice can produce several frequencies, although it is usually limited to about three or four octaves - even if we have a drum-like, groggy 'morning voice' at the low end of the range and a shrill, ear-piercing shriek at the high end. Only the exceptionally gifted people can produce a wide spectrum of vocal sounds spanning several octaves. (Of course, there are those female Indian movie playback singers who can produce ultra high frequencies which only dogs can hear clearly !) By the way, here we are only talking about 'primary' frequencies and not overtones associated with the 'quality' of our voices - remember, overtones are higher frequency components, but produced in much lower intensities.

A piano or a keyboard is a typical Western musical instrument. All we see is a bunch of keys, some in black and some in white. However, upon a closer look, we see that there is a periodicity. As we go from the left of the keyboard to the right (and here I am assuming you know how to sit in front of a keyboard) the keys produce higher and higher frequencies. In fact, the key frequencies are arranged in such a manner that they are in a geometric series. That is, the frequency between any key and the key immediately to its left (irrespective of the color of the key) is a constant, the constant being equal to the twelfth root of two or 1.059. For example, typically, there is a white key in the keyboard set to 240 Hz. Then the adjacent key on the right, a black one as a matter of fact, is set to  $240 \times 1.059 = 254$  Hertz.

By the specific choice of this ratio (twelfth root of two) we see that by the time we reached the thirteenth key, we have doubled our frequency and thus spanned a whole octave. In fact, if you look at the keyboard you see that the key pattern repeats every twelve keys. If you chose the white key at 240 Hz, then the thirteenth key will be at 480 Hz and your octave ranged from 240 to 480 Hz. Equally well, you could have started counting from the black key at 254 Hz and twelve keys later you would have still spanned an octave, except that this time your octave ranged from 254 to 508 Hz.

This division of the octave into twelve 'tones' which have specific ratio between adjacent keys (the ratio equalling 1.059) is peculiar to Western music. This geometric arrangement

of frequencies of the keys in an octave is called an 'Equally tempered' arrangement. And besides the keyboard, most Western musical instruments are also tuned to such an arrangement.

Even though there is a degree of freedom about what you want to be the range of an octave (whether it is from 240 to 480 Hz or 254 to 508 Hz etc.) the Western music defines a standard octave called the 'Middle C octave' (also called the Middle C scale etc) starting from the white key set to 240 Hz. The entire octave (the twelve key pattern, that is) is shown in Fig. 1. On your keyboard, this octave is located somewhere near the middle. Once you figured out where this octave is, you can quickly identify the first key of this octave (set to 240 Hz). And because we know the ratio of the key frequencies now we can pretty much compute the frequency generated by ANY key. You will also notice that the keyboard has about three to four octaves (between 36 to 48 keys, depending on how much you paid for it) The upper octave, starting from 480 Hz is the Upper C octave and the lower octave starting at 120 Hz is the Lower C octave etc.

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1	2	3	4	5	6	7	8	9	10	11	12	
C	D	E	F	G	A	B	C					
(Do)	(Re)	(Mi)	(Fa)	(Sol)	(La)	(Ti)	(Do)					
S	R	G	M	P	D	N	S"					
(Sa)	(Re)	(Ga)	(Ma)	(Pa)	(Da)	(Ni)	(Sa)					

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From Table I given below, we notice that the keys in the octave have labels for identification. Of the white keys - and there are seven of them in an octave - the first one is called C (and hence the name 'Middle C' octave) and then we progress alphabetically to G and then back to A and B, after which, the present octave ends and the C key of the next octave begins. The same labeling system is repeated for the keys in the other octaves as well. If you noticed, the five black keys have ambiguous labels, because each one of them has two labels. The first black key, for example, is called 'C sharp' (C #) or 'D flat' (Db) - it is obvious that 'sharpening' essentially is a technical term for being 'one key higher' and similarly 'flattening' is one key lower in frequency than the white key in the prefix. The labels, frequencies etc of all the twelve keys in the Middle C octave are provided in Table I.

**Table I**

**Arrangement of keys in a keyboard**

Key #	Key color	Frequency (Hz)	Name
1	White	240	C
2	Black	254	C # (D b)
3	White	269	D
4	Black	285	D # (E b)
5	White	302	E
6	White	320	F
7	Black	338.5	F # (G b)
8	White	358.5	G
9	Black	380	G # (A b)
10	White	402	A
11	Black	426	A # (B b)
12	White	451	B

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Now here is a set of bizarre technical terms - by definition, each key is supposed to be a 'semitone' or 'half tone' apart from its adjacent key. Thus, keys which are second nearest neighbors are considered a 'whole tone' apart. (Note that the sense in which we use the word 'tone' here is quite different from our earlier usage of it to mean frequency). For example, the first white key ('C' key) and the first black key ('C sharp') are a 'semitone' apart, whereas the first white key ('C key') and the second white key ('D key') are a full tone (whole tone) apart. And the 'C sharp' and 'D' keys are a semitone apart, as well.

Yet another aside: All keyboards are not necessarily tuned to the middle C key (which is set to 240 Hz). You can build keyboards which have a different reference point. Fixing the middle A key to a particular frequency (440 Hz) is a common alternative.

You can play with the keys and produce music. The keys and the 'tones' they produce are the basic building blocks of music. You can even press the same key twice or stay on one key for an extended period of time. You will also notice that although some 'melodies' are pleasant to the senses, some other sequences are not. If it is the very first time you are tinkering with a keyboard, the odds are that whatever melody you produce sounds 'musical' to you and of course, extremely unpleasant to the others around you. If you

increase the volume on the electric keyboard, you are changing the intensity. If you choose different 'instruments' the modern day keyboards simulate, you are then changing the 'quality'. Basically, you now know how to manipulate the essentials of music, namely the pitch, intensity, duration and quality.

Having said all this, we should also realize that there is nothing inherently scientific or sacred about this 'Equally tempered, twelve key per octave' Western music system, where an arbitrary set point is created at 240 Hz. There are other alternate systems and creative musicians are always experimenting with unconventional systems - in music it is 'cool' to break tradition ! For example, there is no need to have just twelve keys in an octave. In fact, the traditional Indian music system over thousands of years is based on a 22 key per octave system. Even if you chose twelve keys to fill in an octave, there is no reason to tune them in a geometric progression. In other words, you don't have to have an 'Equally tempered scale'. You can locate your frequencies based on some other non-geometric criteria which might 'sound' even better. Such scales in fact, exist and they are called 'Just tempered scales'. In fact, the Indian musical system uses one such scale. And in the final analysis, there is no need to even stick to the concept of octaves when producing music. In short, to produce music, there is no need for a grammar and rules ! If it sounds pleasant, you are on. However, let us first learn the established grammar and tradition, before we attempt to break them!

Even though Indian musical systems are very different from the traditional Western Music system, we can still get a lot of insight into Indian music using the Equally tempered, twelve keys per octave methodology - essentially because it makes things simple. (Also, the keyboard is probably one of the easiest instruments to play). This has always been a bone of contention between the traditional Indian musicologists and the 'quick and dirty' folks like us. The Indian traditionalist will argue that we are compromising by limiting ourselves to just twelve 'tones' per octave, when tradition, dating back thousands of years, categorically spells out twenty two 'tones' per octave. The twenty two 'sruti' for the middle C octave is given in Table III. By the way, the Indian word for frequency or pitch or 'tone' is 'Sruti'. A word of caution though - the term 'Sruti' has several other interpretations and meanings. We will come across some of them later.

Why, some Indian schools of thought even propose that there are infinite frequencies in an octave. The basic reason for such demands for more than twelve 'srutis' per octave is that Indian music, (not just Karnatic music) seems to 'flow' through the frequencies, whereas a Western song seems 'jumpy'. Take for example, 'Baa baa black sheep' and compare it to an Indian song, say, a movie song like 'Roop tera mastaana'. The Indian song seems to involve a lot of vocal acrobatics and nuances and not just go through piano-like jumps. This is the main difference between the Indian and Western music and we will return to this point again and again in this primer.

This is the reason why Indian classical music cannot be played effectively in a twelve key per octave instrument like a piano. Of course, several Western instruments have been 'adapted' with a little modification here and there, to play Indian classical music - violin, mandolin and guitar, for example. Some other instruments have been simply 'used',

without modification, such as the harmonium and its latest cousin, the keyboard. Indian purists abhor such blatant use of Western, 'equally tempered' instruments. Expert harmonium player, Rajan Parrikar, points out that 'Just tempered' harmoniums, harmoniums with 22 tones per octave, even over 50 tones per octave etc have been built by various people.

Now let us come back to this basic difference between the Western and the Indian classical music system. We noted that in Indian music it is not enough to produce just twelve or even twenty two 'tones' in an octave. One ought to produce even the intermediate frequencies. These intermediate frequencies, which do not have any keys to produce them, are called 'microtones'. The Indian word for the 'microtone' is 'gamakam'. (of course, 'gamak' in hindi) It is often very difficult to explain this concept clearly and precisely. If the C key produces 240 Hz and the C# key produces 254 Hz what intermediate frequencies are we talking about ? Does Indian music use sounds produced at 247 Hz ? Treatises have been written in India about such microtonal aspects of music. Suffice it to say that microtones or gamakams tend to be clustered around the primary key frequency, although this need not always be the case.

Note that if you postulate that an Indian music octave has twenty two or two hundred keys or infinity per octave, then what used to be a 'microtone' in a twelve-key system could now very well be a key. Of course, you can make a piano with such large number of tones per octave. It may be a long piano and you will need a superhuman dexterity to play it. But the positive side of it is that you will be able to play Indian music on it. The bottomline is, the piano produces just twelve frequencies in one octave and that is enough to compose a lot of Western songs. Whereas, to make Indian music, twelve keys are not enough in an octave.

Let us talk some more about microtones or gamakams. The vocal gliding and rolling in Indian music, (Remember Kishore Kumar's yodelling ?) whether it sounds good or not, are again examples of microtone usage. In fact, the microtones add variety to the Indian classical music - an extra dimension. From movie songs to folk music to classical music, the very heart of Indian music is this 'continuous flow' or 'gliding through a continuum of frequencies' or gamakam or microtonal excursions. Thus it is often said that Indian music is 'melody-based'. Since microtones are so important in Karnatic and Hindustani music and very few instruments can produce all the frequencies in an octave, the best enunciation of Indian classical music is in vocal singing. Many instruments like the violin, Gottuvadhyam (called Chitra Veena these days) and even the simple bamboo flute can produce a lot of gamakams, of course.

Just to drag the concept a little farther - some of you who have grown up in India may have developed a taste for Indian music, be it movie songs or highly classical songs. When you were exposed to Western rock and roll music you may have been drawn toward the numbers rich in gamakams (The Beatles, Simon and Garfunkel et al have produced many such pieces) rather than the rhythm oriented heavy metal numbers.



In the same breath, people say that the Western music is 'harmony-based', which brings out yet another difference between the two systems. 'Harmony' is produced when several instruments play different melodies or pieces simultaneously like in an orchestra. Harmony is also produced when more than one tone is produced at the same time. In the Western Music, 'harmony' is an important element.

Orchestration and 'harmony' are absent in Indian classical music. People have tried out orchestration of Indian classical music time and time again with limited success. (and there have been probably as many Western attempts to compose and play 'Indian style' melody based classical music) There is not much of a market for such 'Fusion' music, except perhaps among the fringe elements of the immigrant Indian community :-). Even if there is a 'Jugal bandhi' - a standard fare in Hindustani classical music where two instruments (or even two vocalists) are featured together, the musicians usually follow the same melodic pattern one after another with minor variation rather than play different melodies simultaneously.

There are a number of other differences as well between the two systems of music. Indian classical music, for example, does not use what are called chords, or pressing more than one key simultaneously. Chords are a major aspect of Western music and producing harmony via chords is a natural consequence of the Equally tempered (geometric series) arrangement of the keys. If keys were arranged in a Just tempered sequence, pressing more than one key at a given time might produce an unpleasant sound pattern resulting in what is called 'Besur' (in Hindustani music) or 'Abaswaram' (in Karnatic music). By the way, one more advantage of Equal temperament of pianos and keyboards is that it makes it easier to 'tune' them, (they go out of tune every once in a while and need to be tuned periodically) since each key is harmonically related to the other keys. In case of Just tempered arrangement, since the key ratio between adjacent keys is not a constant, most keys will have to be tuned individually.

Also absent is 'polyphony' - where several instruments (melodies) come and go asynchronously instead of at periodically predictable times. Also, the Western scales are standardized. The middle C octave ranges from 240 to 480 Hz. There is no reason to stick to these frequencies. In fact, in Indian music, you have the freedom to choose the frequency range of the octave from anywhere to twice anywhere. You can start at 230 Hz, if you wish. Also, in Western classical music, most musicians have music notated on sheets of paper and 'read' it when performing. Indian music is always played by 'ear'.

Just to summarize, the essential differences between Indian classical music system and the Western music are (a) the Western keyboard is 'Equally tempered' whereas the Indian keyboard ideally should be 'Just tempered' (b) Only twelve keys per octave are used in the West, whereas to play Indian music one needs to produce several intermediate microtones, not represented by a conventional keyboard - This is the most major difference (c) Harmony, chords, polyphony etc are absent in Indian classical music (d) In Indian music, there is no need to standardize an octave to begin at 240 Hz.

We have enunciated again and again that we need many, many microtones to produce Indian music. Still, in this chapter, we are going to use a conventional, Western keyboard to learn about Indian music. It is almost like the Indian music is an analog entity and we are trying to quantize or digitize it into twelve keys, knowing fully well that we will have something akin to truncation (approximation) errors.

But before we begin, let us define one more term - the 'note'. The 'note' is just a primitive element of a musical phrase. An analogy will be the concept of a 'syllable' in a spoken word or a letter in a written word.

For example, in the nursery rhyme 'Baa baa black sheep' there are four 'notes', namely 'baa', 'baa', 'black' and 'sheep'. By a curious coincidence, this line also has four syllables - and we have managed to make a 'note' for each syllable. The concept of a note is so simple that even if you know nothing about music, you may be able to tell how many notes there are in a (simple) melodic pattern.

On the other hand, consider 'Roop tera mastana, pyaar meraa...' When spoken, the word 'roop' has only one syllable. However, when sung, it is distorted to sound like 'roo - pu' and uses TWO 'notes'. Similarly, when the singer goes 'pyaar meraaaa', he glides the end of the word 'meraana' into several 'notes'. The term 'note' and 'tone' are different and make sure you understand it. The word 'tone' is essentially a frequency, whereas the 'note' is the smallest part of a melody and could last one 'tone' plus possible microtones. The Indian word for 'note' is 'Swaram' or 'sur'. Now we are ready to get more technical and tinker with any commercially available keyboard to learn about Indian classical music. A diagram showing a typical keyboard octave is given in Table II, except that now we have labeled the keys with Indian names. Once again, eight out of the twelve keys have unique labels, whereas four of the remaining keys - keys 3, 4, 10 and 11 - have ambiguous (two possible) names. Unlike the Western notation, the keys with ambiguous labels are both black and white (two of each).

In the Indian system, we do not use alphabets to label keys. Instead, we use short, meaningless (please don't beat me to death on this - I know there are etymological reasons for choosing these set of syllables) syllables which go - Sa ri ga ma pa dha ni. These seven syllables are actually mnemonics to represent the 'notes' or 'Swarams' in Indian music. They are referred to as the 'Saptha Swarams' or 'Seven Swarams'. So, confusing as it may sound, in Indian music, we use the 'notes' to represent the 'tones'. Upon looking at Table II some more, we see that some THREE keys can be designated as 'ri', (even though they are designated as ri 1, ri 2 etc, they are all 'called' ri) three keys as 'ga', two as 'ma', three as 'dha' and three as 'ni'. However, there is no ambiguity when we want to press the keys corresponding to 'Sa' or 'Pa' - they are unique.

This notation (and this set of seven 'notes') is also called the 'Solfege notation' (in the West). Remember, even in the West, there is a solfege notation which goes do, re, me, soh etc. Basically, the solfege notation is a 'singable' set of syllables which helps us describe a musical melody. It will sound quite ridiculous to sing out words like 'C, C sharp, E flat' - instead of 'do fa la' when we hit the keyboard keys.

(An aside: The complete names of the Indian notation are as follows: Shadjam for Sa, Rishabham for ri, Gandhaaram for ga, Madhyamam for Ma, Panchamam for pa, Dhaivatam for dha and Nishaadham for ni - This information is provided just so that you don't get too zapped when someone uses these full names)

Even in case of Indian music, we can extend our labeling of the keys to other octaves, much like in the Western system. In Indian music, the main octave is called 'Madhya stayi', the octave above it (higher) is called 'tara stayi' and the octave just below the Madhya stayi is called 'Mandra stayi' (based on the way 'mantras' were chanted in low frequencies in the centuries past). In terms of notation, the keys in the higher octave are labeled with a dot on TOP of the notes. The keys in the Mandra (lower) stayi are identified with dots BELOW the solfege notes.

Many good Indian musicians have voices spanning the entire three octaves, although most Indian compositions use up just the complete Madhya stayi scale and the top half of the Mandra stayi (only half an octave below) and the bottom half of the Tara stayi (just half an octave above the Madhya stayi).

We also see that the twelve keys of the octave divide into two halves. The four keys which are designated as ri and ga are called the 'bottom tetrachord' (in Indian terminology, 'Poorvaangam') and similarly the four keys corresponding to dha and ni are called the 'upper tetrachord' or 'Uttaraangam'. There is some kind of a symmetry between the bottom and the top tetrachords and key label assignment.

Just when you thought you had seen enough of the buzzwords, here is one more ! The starting frequency of your personalized octave relative to a 'standard' octave determines the 'pitch' of your voice. Your signature 'pitch' or 'sruti' (here we are using the word 'sruti' to mean 'the starting frequency of 'your' octave') is measured in a weird sounding unit called 'kattai'. Half a 'kattai' is a semitone and a full kattai is a 'whole tone'. If your octave happens to start at 240 Hz then you have a 'four kattai sruti', by definition. If your voice is very low pitched then you can have lower than four kattai as in case of many males. Women and children are high pitched and can have higher than four (even six) kattai srutis and their octave will start at frequencies higher than 240 Hz. An approximate Western equivalent of this is called 'Register'. In Indian classical music, the octaves are 'free floating', varying from person to person. The starting points are not pegged at 240 Hz.

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## Table II

### Karnatic names for keys in a keyboard

Key #	Western name	Karnatic (Notation 1)	Karnatic (Notation 2)
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1	C	Sa	S
2	C # (D b)	Ri 1	R1
3	D	Ri 2 (Ga 1)	R2 (G1)
4	D # (E b)	Ri 3 (Ga 2)	R3 (G2)
5	E	Ga 3	G3
6	F	Ma 1	M1
7	F # (G b)	Ma 2	M2
8	G	Pa	P1
9	G # (A b)	Dha 1	D1
10	A	Dha 2 (Ni 1)	D2 (N1)
11	A # (B b)	Dha 3 (Ni 2)	D3 (N2)
12	B	Ni 3	N3

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It is also common to abbreviate the seven notes sa, ri, ga, ma, pa, dha, ni to letters S, R, G, M, P, D and N. The way to use this table is to realize that when you hit the first key of the octave (the C key) you will sing out 'Sa'. When you hit the first black key (C sharp) you will sing out 'Ri'. On the third key, you will sing out 'Ri' or perhaps a 'Ga' depending on the context. More about this 'context' later.

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## Table III

### 22 Sruti scheme

Sruti	Frequency ratio	Frequency (Hertz)
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Sa	1	240
Ri 1	32/31	252.8
Ri 2	16/15	256
Ri 3	10/9	266.6
Ri 4	9/8	270
Ga 1	32/27	284.4
Ga 2	6/5	288
Ga 3	5/4	300
Ga 4	81/64	303.7
Ma 1	4/3	320
Ma 2	27/20	324
Ma 3	45/32	337.5
Ma 4	64/45	341.3
Pa	3/2	360
Dha 1	128/81	379
Dha 2	8/5	384
Dha 3	5/3	400
Dha 4	27/16	405
Ni 1	16/9	426.6
Ni 2	9/5	432
Ni 3	15/8	450
Ni 4	31/16	465



# **A GENTLE INTRODUCTION TO SOUTH INDIAN CLASSICAL (KARNATIC) MUSIC**

## **PART II of IV**

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### **LET US MAKE A TUNE! (THE CONCEPT OF A SCALE)**

We have learnt about the keyboard, labeled the various keys under the Eastern and Western schemes and even quarreled about whether it should have 12 keys or 22 to an octave. We now know that these keys are like the alphabets in creating music. How then do we compose music?

Before we answer this question, let us see if we can say something about the structure of a 'tune' or the 'melody' itself. If we listen to any musical piece such as 'Jana gana mana' or 'Roop tera mastana', we notice that their second lines and subsequent lines are not just mindless imitation or repetition of the first lines. There is an elaboration of a theme as the song unfolds. You could listen to any line of 'Roop tera mastana' and feel that it is connected to the first line, in a musical sense. If someone played a musical phrase from the song at random, the odds are you would guess that it is from 'Roop tera mastana'. And it may sound trivial, but you also notice that 'Roop tera mastana' does not at all sound like 'Jana gana mana'. There is a character, a structure and an identity to the song, however vague the concept may sound. (note the pun on the word 'sound' !) If you have grasped this abstract concept, you have almost understood the concept of a 'Ragam' (or 'raga' or 'rag') because a Ragam is also an embodiment of a particular musical identity.

For example, if you heard the song 'Vande maataram, Shujalaam shuphalaam...' you can tell that it has its own identity, which is different from the way 'Jana gana mana..' or 'Roop tera mastana ..' sound. This song is in fact, based on a Ragam called 'Desh'.

How do we forge such special musical identities using a keyboard ? The answer lies in choosing just a SUBSET of keys out of the twelve keys available in an octave (instead of all twelve) and sticking to just this subset of keys while making music. If you used all the keys in the keyboard to compose one song, you may not create anything with an identity. (You will see, as you understand more about music that this statement is strictly not true. There are nice-sounding musical compositions where almost all the keys are used)

Let us take an example. Let us choose just all the white keys in an octave - that is, use only seven out of the twelve keys. And let us play the keys in any order, even stay on one key for whatever length of time if we choose to do so. Let us allow ourselves to go to the white keys in the octaves below and above the standard octave as well. After a few minutes, you may sense an 'effect', a 'whole-ness' ('Gestalt!') or a personality to the sound. If you don't believe me, have your friend play the keyboard with only the white keys.

Now close your eyes and ask him (or her) to occasionally hit any black key. You can easily tell whenever the black keys are hit, because you are now sensitive to the 'structure' or 'character' produced by the seven white keys.

Is there a lower limit on how FEW keys we can choose in our subset and still get by ? If we chose a subset of just three keys (say, the first three white keys) in an octave and limit ourselves to those keys, we see that we don't have much variety to the melodies we can produce. It may sound like a drum beating. But is devoid of any special melodic personality. In general, (note that this is not an absolute law) one chooses five or six or seven keys out of the twelve keys available in an octave. More about these selection rules later. Once these keys are selected, the corresponding keys in the other octaves are also automatically selected and used in melody making.

In the context of Indian music, one has an extra degree of freedom. One can choose one set of keys to go up in frequency in the octave and choose an entirely different set to come down the octave, if we so desire. The key sequence to go up is called 'Arohanam' and the key sequence which forms the descending order is called the 'Avarohanam'. More about it later as well ! Let us now stick to 'symmetric' choices while going up or down. At the risk of sounding repetitive, let me say that you can always decide to be a non-conformist and follow none of these so-called rules and conventions. Music is after all, a creative art and the final criterion is whether it sounds pleasing.

How do we select the 'subset' of keys ? Our ancestors have done quite a bit of research on such selection rules and have come up with algorithms. Let us look at the Western music first. The 'Major' Scale is a very typical selection algorithm. This helps you select seven keys in an octave. The rules are as follows:

First key - Choose ANY key in the octave.

Second key - Skip the adjacent key to the right, choose the one after that. In effect, you have moved a 'whole tone' from the first key. Remember the concept of 'whole tones' and 'semitones' from the previous chapter. And that the whole tone equals shifting two semitones.

Third key - Again, skip the adjacent key to the right, choose the second one (again, you have moved a 'whole tone')

Fourth key - select the adjacent key. (you have moved a 'half tone' or a semitone)

Fifth key - Skip the next key, but select the one after that. Once again, you have moved a full tone.

Sixth key - Skip the next key and select the one after that.

Seventh key - Select the adjacent key.



In short, your frequency selection is:

Select a key and then move,

Whole tone - whole tone - half tone - whole tone - whole tone - whole tone - half tone

If you started with the usual C key, the first white key, you will see that the 'C Major scale' is simply all white keys. This is a very 'major' scale, really, with a lot of popular compositions. And in the process of introducing this algorithm, we have also defined the term 'scale', which is simply a sequence of keys. Also, the algorithm 'wraps around itself'. That is, if you started out with the F key for example, and created the F Major Scale, you will spill over to the next octave. But that is okay, because you can fill up the rest of your scale by starting out with the F key of the PREVIOUS octave. That is, with this algorithm, you will always select seven keys in an octave. A question to ask is - will we get unique sequences using this algorithm every time we start off with a new key ? Or is there a possibility of our sequence repeating itself for two different starting keys, i.e, is the C Major scale different from D Major and are there twelve unique Major scales ? (I will leave this as an exercise for the very enthusiastic reader !)

Similarly, other algorithms can also be defined. One other choice is called the Minor scale - which is in reality a generic name for three different algorithms. One of them goes as

Whole - half - whole - whole - half - whole - whole (with the freedom to choose the first key)

I am not giving the selection rules for the other two 'Minor' algorithms. Again there are twelve keys we can select as our first key and therefore we can generate twelve sequences per Minor algorithm and there are three such 'Minor' algorithms, bringing a grand total of twelve times three, thirty six possible Minor scales. But we discover that many of the scales repeat themselves and in reality the number of unique 'scales' are fewer than thirty six Minor plus twelve Major scales.

Coming back to Indian system, even the ancient Tamil literary work, Silappadhikaram talks of an algorithm called 'Ilikramam', fascinating as it sounds. The rules of Ilikramam are quite similar to the selection of Major and Minor scales. It is really fun to work out this algorithm and derive a bunch of scales. (If you are more interested in this, refer to Prof. Ramanathan's book in the Reference section) In fact, nothing stops you at this point to go ahead and create your own selection rules to choose seven keys out of the twelve in the octave.

But let us turn our attention to Karnatic music. (Also, at this point, I will depart from talking about Indian classical music in general and stick only to South Indian music. Wherever relevant, references will be made to Hindustani music)

In Karnatic music, a very famous algorithm exists to select the keys in an octave, which forms the basis of important scales, which are called the 'Melakarta Scheme'. The Melakarta scheme selection algorithm is as follows: Please refer to Fig. 3 or Table II)

Rule 1: Always select the first white key ! The 'Sa'.

Rule 2: Always select the Pa key. This is a convenient midpoint of the octave, sort of.

Rule 3: Select one of the two Ma keys (Ma1 or Ma2 - note that one of them is black and the other one is white) Once selected, this key is your 'Ma'.

Rule 4: Select ANY two keys out of the four keys in the lower tetrachord. (From Keys 2, 3, 4 and 5) Once selected, the first of these two keys will be your 'Ri' and the second your 'ga'.

Rule 5: Select ANY two keys out of the four keys in the upper tetrachord. (From keys 9, 10, 11 and 12) Once selected, the first of the two keys will be your 'dha' and the second will be your 'ni'. This rule is exactly like Rule 4.

Once all the seven keys are chosen, you have your complete sa ri ga ma pa dha ni.

Let us see how many Melakartas or scales we can build this way. By Rule 4, you can choose two keys out of four in SIX different ways going by the elementary combination theory. Similarly, going by Rule 5, we can choose two keys out of four in SIX different ways. By Rule 3, you can choose one key out of two in TWO different ways. So we get

SIX times SIX times TWO = Seventy Two Melakartas or Melakarta ragams.

And they are all unique.

By definition, the Melakarta Ragams are symmetric with respect to going up in octave or down. Saying the same thing more technically, in Melakarta Ragams, the Arohanam and the Avarohanams are simply reversed. The sequence Sa ri ga ma pa dha ni is Arohanam. The reversed sequence Sa ni dha pa ma ga ri is Avarohanam. The Melakarta Ragams are also called 'Sampoorna ragams' or Complete ragams.

Interestingly, even the Melakarta selection algorithm allows us to choose all seven white keys, the same as the Western C Major scale. In Karnatic music, we call the resulting Melakarta ragam as Shankarabharanam. (You may have even heard of this ragam) In Hindustani music, the set of all white keys is called the 'Bilaval thaat', one of the major building blocks of Hindustani musical system.

Let us now go back to Table II and see why notation 1 makes sense. For example, you can pick up any two keys from the keys 2, 3, 4 and 5 and still call the first one of those as Ri and the second one as Ga. If you chose keys 2 and 5 then, you will sing out 'ri' when you strike key 2 and 'ga' when you strike key 5. On the other hand, if you chose keys 3

and 4 you will say 'ri' for key 3 and 'ga' for key 4. Finally if you chose keys 2 and 3, then key 3 will be a 'ga' (and not 'ri') in this situation. The rule is, the first key used among these four keys is a 'ri' and the second one is 'ga' no matter which absolute position the keys are located at. Keys 3 and 4 have the dubious honor of being a ri or a ga depending on the situation. These arguments are also valid in the upper tetrachord and in the choice of 'dha' and 'ni'. Now perhaps we can understand why three keys were designated as 'ri' or 'ga' or 'dha' or ni.

A caveat. I am using the word 'Ragam' in a loose sense here. A Ragam is not just a scale or a bunch of keys - it is more than that. Remember, I told you over and over and over that microtones are everything in Indian classical music and keys in a keyboard are simply digitized approximations. The seven white keys alone are not enough to give the resulting music the flavor of ragam 'Shankarabharanam' - it is those seven keys PLUS all the associated microtones (I know, I am being vague, but there is no simple way to get around it !) which constitute the 'Shankarabharanam' ragam. In fact, you may hear shades of Shankarabharanam when someone plays the Western C Major or Hindustani Bilaval. But the 'shades' are different for C Major and Bilaval and Shankarabharanam. C Major does not have any gamakam, Bilaval has some and Shankarabharanam has another set of gamakams. It is important to listen to some music and figure out if you can identify an artiste go through gamakams. A simple rolling of the tongue, subtle jumps and modulation or vibrattos are all indicative of gamakams.

Also, if you are the type that questions authority, you may equally well question the Melakarta selection rules. Why should we include Pa always and why can't we include BOTH the Ma1 and Ma2 keys in the same scale ? In Hindustani music there are ragams which use both the Ma keys, although it is a no-no in Karnatic. (once you become more advanced you will see that even in Karnatic music some pieces use both the Mas)

Finally, we should notice a fundamental difference between the Western system of scale building compared to the Melakarta scheme. In the Western classical music, you started off on a specific key, used the algorithm to generate the next key, which in turn led you to the third key of the scale and so forth. You sequentially generated the keys one after another by just shifting a whole tone or half a tone. By a curious coincidence even the Ilikkramam algorithm in Silappadhikaram is a similar 'Mode shifting' or 'tone shifting' algorithm. By contrast, the Melakarta scheme is a brutally mathematical scheme where you selected 7 keys out of a possible 12 keys, subject to certain constraints - here you figured out the frequency relationship between the keys much later. One important consequence: In the Western scale system, the keys in a scale are not more than a 'whole tone' apart, i. e., in any Major or Minor scale, you 'skip' at the maximum just one key. Whereas in Melakarta scheme, you can choose Key 1, Key 2, Key 3, Key 7, key 8, key 11 and key 12 by the algorithm. (This corresponds to Ragam Raghupriya) Notice the big gap between key 3 and key 7 (between the 'ga' and 'ma') where we skipped over three keys (This amounts to skipping two whole tones or four semitones). Also, we skipped two keys between 'pa' and 'dha'. (keys 8 and 11) Such large 'Intervals' ('Interval' is yet another musical term !) can produce 'unpleasant' listening experience. And although Raghupriya is a legitimate Ragam, it is about as popular as rain during a picnic.

## SOME MORE DISCUSSION ON MELAKARTA RAGAMS

(Skip this chapter if you want to during the first reading ! But, on other hand, the Melakarta scheme is a fascinating piece of classification. You might want to read it for the fun of it)

A scholar named Venkatamakhin invented the Melakarta scheme, way back in the seventeenth century. He was the first to comprehensively classify Ragams in a 'Periodic table' like arrangement. A complete list of the 72 Melakarta Ragams is given in Table IV with the corresponding scales. When Venkatamakhin devised his Table, only a few of the 72 Ragams were known. Using his schematization Venkatamakhin not only cataloged the existing Melakarta Ragams, but also filled in the 'gaps' by coming up with the key sequence for the rest of the Melakarta Ragams. Thus this scheme helped 'discover' new Melakarta Ragams, which in turn led to even newer derivative or child Ragams using those. Composers and performers lapped it up and made songs in the newer, hitherto unknown Ragams. In Table IV, the ragam number 29 is our friendly ragam, Shankarabharanam, although its less well-known official name DhheeraShankarabharanam is used in the table.

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**Table IV**

### The 72 Melakarta Ragams and their scales

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#	Name	Ri ga Dha ni	#	Name	Ri ga Dha ni
	Suddha Madhyamam (M1)			Prati Madhyamam (M2)	
1	Kanakanki	R1 G1 D1 N1	37	Salagam	R1 G1 D1
N1					
2	Ratnangi	R1 G1 D1 N2	38	Jalarnavam	R1 G1 D1
N2					
3	Ganamurti	R1 G1 D1 N3	39	Jhalavarali	R1 G1 D1
N3					

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4 Vanaspati N2	R1 G1 D2 N2	40 Navaneetam	R1 G1 D2
5 Manavati N3	R1 G1 D2 N3	41 Pavani	R1 G1 D2
6 Tanarupi N3	R1 G1 D3 N3	42 Raghupriya	R1 G1 D3
7 Senavati N1	R1 G2 D1 N1	43 Gavambodhi	R1 G2 D1
8 Hanumatodi N2	R1 G2 D1 N2	44 Bhavapriya	R1 G2 D1
9 Dhenuka N3	R1 G2 D1 N3	45 Subhapantuvarali	R1 G2 D1
10 Natakapriya N2	R1 G2 D2 N2	46 Shadvigamargini	R1 G2 D2
11 Kokilapriya N3	R1 G2 D2 N3	47 Suvarnangi	R1 G2 D2
12 Rupavati N3	R1 G2 D3 N3	48 Divyamani	R1 G2 D3
13 Gayakapriya N1	R1 G3 D1 N1	49 Dhavalambari	R1 G3 D1
14 Vakulabharanam N2	R1 G3 D1 N2	50 Namanarayani	R1 G3 D1
15 Mayamalavagoulai N3	R1 G3 D1 N3	51 Kamavardhini	R1 G3 D1
16 Chakravaham N2	R1 G3 D2 N2	52 Ramapriya	R1 G3 D2
17 Suryakantam N3	R1 G3 D2 N3	53 Gamanasrama	R1 G3 D2
18 Hatakambhari N3	R1 G3 D3 N3	54 Viswambhari	R1 G3 D3
19 Jhankaradhwani N1	R2 G2 D1 N1	55 Syamalangi	R2 G2 D1
20 Natabhairavi N2	R2 G2 D1 N2	56 Shanmukhapriya	R2 G2 D1
21 Keeravani N3	R2 G2 D1 N3	57 Simhendramadhyamam	R2 G2 D1
22 Kharaharapriya N2	R2 G2 D2 N2	58 Hemavati	R2 G2 D2

23 Gourimanohari N3	R2 G2 D2 N3	59 Dharamavai	R2 G2 D2
24 Varunapriya N3	R2 G2 D3 N3	60 Nitimati	R2 G2 D3
25 Mararanjani N1	R2 G3 D1 N1	61 Kantamani	R2 G3 D1
26 Charukesi N2	R2 G3 D1 N2	62 Rishabhapriya	R2 G3 D1
27 Sarasangi N3	R2 G3 D1 N3	63 Latangi	R2 G3 D1
28 Harikambhoji N2	R2 G3 D2 N2	64 Vachaspati	R2 G3 D2
29 Dheerasankarabharanam N3	R2 G3 D2 N3	65 Mechakalyani	R2 G3 D2
30 Naganandini N3	R2 G3 D3 N3	66 Chitrambhari	R2 G3 D3
31 Yagapriya N1	R3 G3 D1 N1	67 Sucharitra	R3 G3 D1
32 Ragavardhini N2	R3 G3 D1 N2	68 Jyotiswarupini	R3 G3 D1
33 Gangeyabhusani N3	R3 G3 D1 N3	69 Dhatuwardhini	R3 G3 D1
34 Vagadheeswari N2	R3 G3 D2 N2	70 Nasikabhusani	R3 G3 D2
35 Sulini N3	R3 G3 D2 N3	71 Kosalam	R3 G3 D2
36 Chalanattai N3	R3 G3 D3 N3	72 Rasikapriya	R3 G3 D3

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This brings out another interesting aspect of the Melakarta Scheme. The names of the ragams are not arbitrary. The names contain mnemonics which spell out which keys are used in the ragam. From the name DhheeraShankarabharanam, we could figure out that it is all white keys ! (Venkatamakhin was lucky that most of the 72 ragams were not known then, so he could assign names to them or add a prefix to the existing ones. Imagine if all the ragams were to exist first and then you try to group them, you may not have such

mnemonics possible) In fact, in Hindustani music, such schemes were not invented and now we have hundreds of ragams which are tough to classify using such simple mnemonics. Of course, the absence of such a comprehensive scheme is by no means a negative or a deficiency on the Hindustani musical system. In music, like in most things in life, we don't (and should not) want to make value judgements !

Let me now explain you the mnemonic or the Katayapadi System. (Thanks to R. Pichumani for the notes in this section) A look-up table is created, given in Table V that assigns syllables to numbers.

**Table V**

**Katayapadi system of naming the Melakarta ragams**

Number	0	1	2	3	4	5	6	7	8
9									
Syllable		ka	kha	ga	gha	-	cha	chha	ja
jha									
ddha		ta	tta	da	dda	-	tha	thha	dha
	na	pa	pha	ba	bha	ma			
ha		ya	ra	la	va		sha	shha	sa

The above scheme works as follows:

(1) Assign numbers to the first two syllables of the Melakarta ragam. Example, Harikambhoji, the syllable 'Ha' is 8 and 'ra' is 2 and thus Hari is 82. The melakarta number of this ragam is obtained by simply interchanging the digits, i. e 82 becomes 28 and in fact, Harikambhoji is the 28 th melakarta ragam.

(2) A few more example, Kanakangi. Ka is 1 and Na is 0 and thus Kana is 10. Interchanging the digits we get 10 -- 01 and thus this is the first melakarta ragam.

DhheeraShankarabharanam, here Dhha is 9 and ra is 2 and thus Dhheera is 92, transposing which we get 29 which is the position of the ragam. You can see that Shankarabharanam probably existed before the scheme was invented and thus the author had to alias it to conform to his look-up table scheme. There are other such aliased ragams. The popular ragam Todi is aliased to become Hanumatodi and Kalyani is officially Mechakalyani, just so that they follow the Katayapadi naming scheme. Another example, Mayamalavagaulai, (used to be called just Malavagaulai) has Ma which is 5 and Ya which is 1 and thus yielding 51, which when inverted gives 15, which is the place in the order.

Take SimhendraMadhyamam. Sa is 7 and Ma is 5 and thus Simha is 75 and the melakarta number is 57. However you must notice that the second syllable, Mha is a compound syllable combining ma and ha. In these cases, we usually take the first of the two sounds. There are some exceptions too. In Ratnangi, Ra is 2 and we take the 'Na' part of 'Thna' and arrive at the destination 02. If you used 'Th' instead of 'Na', you will get the number 62 for this melakarta, which is firmly occupied by ragam Rishabhapriya.

What are the advantages of such mathematical and almost 'hackers' kind of scheme ?

(1) The melakarta scheme does not tell you if a given ragam is a melakarta or not. If you know it is a melakarta ragam, you can find out what number it has in the sequence. For example, you can try to see what number is ragam Poorvikalyani, which is not a melakarta. This would be 21 if you consider Pa ra. (or if you considered Pa and Va it is 41) However, it is not even a melakarta ragam and you cannot use the above look-up table.

(2) Incidentally, if you look up Table IV which lists all the melakarta ragam, you will see that the two very famous ragams Shankarabharanam (called DhheeraShankarabharanam) and Kalyani (called Mechakalyani) have almost identical notes except for the Ma. Shankarabharanam uses Ma1, which is called Shuddha Madhyamam, whereas Kalyani uses Ma2 which is called Prati Madhyamam. Thus the table is divided into two groups of 36 ragams each and the only difference between the ragam on the left and the one on the right is the Ma key used. The first 36 from Kanakangi to Chalanattai are called Suddha Madhyamam ragams and the other 36 are called Prati Madhyamam ragams. Melakartas which differ from each other by 36 (Such as Harikambhoji and Vachaspati, Keeravani



and Simhendramadhyamam) have the same Arohanam and Avarohanam except for the Ma.

(3) How do we figure out the Arohanam and Avarohanam or which keys to use from the name of the melakarta ragam ? If somebody tells you Keeravani, can you quickly locate the keys on a keyboard corresponding to the ragam ? You just have to look at the Table IV to see how cyclical the whole thing is. All melakarta ragams in the same group of six (i. e, 1 to 6, 7 to 12, 25 to 30 etc) have the same Sa ri ga ma. All ragams which differ from each other by six have the same Pa dha ni sa. (Karaharapriya(22), Harikambhoji(28), Hemavati(58), Nasikabhoosani(70) all have the same Pa dha ni sa, because they all leave a remainder of 4 when divided by 6)

**Just to summarize:**

**(i) All Melakarta Ragams from 1 to 36 use Ma 1. Those from 37 to 72 use Ma 2.**

**(ii) The ri ga assignment is as follows:**

Ri 1 - Ga 1 Melakartas 1 through 6, 37 through 42

Ri 1 - Ga 2 Melakartas 7 through 12, 43 through 48

Ri 1 - Ga 3 Melakartas 13 through 18, 49 through 54

Ri 2 - Ga 2 Melakartas 19 through 24, 55 through 60

Ri 2 - Ga 3 Melakartas 25 through 30, 61 through 66

Ri 3 - Ga 3 Melakartas 31 through 36, 67 through 72

**(iii) The dha ni assignment is as follows:**

Take the Melakarta number and divide it by six and look at the remainder.

Dha 1 - Ni 1 if the remainder is 1

Dha 1 - Ni 2 if the remainder is 2

Dha 1 - Ni 3 if the remainder is 3

Dha 2 - Ni 2 if the remainder is 4

Dha 2 - Ni 3 if the remainder is 5

Dha 3 - Ni 3 if the remainder is zero

So all you have to do is take a melakarta ragam. From its name determine its number in the scheme. From the number, figure out the Arohanam and Avarohanam. Simple enough !

Again, among the 72 such major ragams, not all of them are equally popular. Some of them are quite obscure, especially the ones whose keys are not spread apart well throughout the octave. However, many musicians have composed in all 72 melakartas - Koteeswara Iyer for one. Musicians like M. S. Subbulakshmi and S. Balachandar have recorded all 72 melakartas. The Suddha Madhyamam (Suddha Madhyamam is just the official name for Ma 1) group of 36 ragams are by and large more popular than the Prati Madhyamam (Prati Madhyamam is the same as Ma 2) group. The Ma2 is supposed to be more 'negative' and 'sad' !! The more unpopular ragams are the ones like Kanakangi, which use closely spaced keys. The ragam Mayamalavagaulai on the other hand has a well spread out keys - Sa-ri1-space-ga2-ma1-space-pa-dha1-space-ni2-sa. This is the ragam all beginners are taught, essentially because such a dispersed set of notes is more easy for a beginner to learn.

>From these complete ragams, you can derive 'child ragams' omitting a key here and a key there in the arohanam or avarohanam. Some melakartas are parents of a large number of popular 'child' or 'janya' or 'derived' ragams - melakartas like Natabhairavi, Kharaharapriya, Harikambhoji for example. We will see this in the next section.

You may wonder how just one key makes a difference. I just told you that the ragams Kalyani and Shankarabharanam have identical arohanam and avarohanam, except for the key used to produce the 'ma' syllable. You have to listen to your keyboard. Play Kalyani and Shankarabharanam on the keyboard (and even though you don't produce the 'microtones' and even though you are playing an 'equally tempered instrument') you can tell the two apart. The ma key makes a big difference and one has to simply listen to music a lot to train one's ears.

Since melakartas have the maximum allowed seven notes in a ragam, they have an enormous scope for melody making, compared to a derived ragam which may have less than seven notes. Thus melakarta ragams are very popular in concerts. Musicians choose them for the 'heavy' part of the concert and try to exhibit their mastery.

**WHAT IS A 'RAGAM'?** Now that we have studied the Melakarta scheme inside and out, let us go on to generate the secondary or 'janya' or derived Ragams (the rest of the Ragams, that is) based on some simple guidelines. These are only guidelines and are not hard and fast rules:

(1) A Ragam should use at least five keys in an octave and utmost seven keys in the Arohanam as well as the Avarohanam.

(2) The Arohanam or ascending order of the notes (or Avarohanam or descending order, for that matter) is obtained by simply taking a Melakarta scale and omitting none or one

note or two notes. (Remember, the Melakarta scale has seven notes and so we can end up with seven or six or five notes in the derived scale)

For example, let us (yet again !) take Ragam Shankarabharanam. If we omit the keys 'Ma' and 'Ni' and use only the five white keys Sa, Ri, Ga, Pa, Dha then we obtain a famous Ragam called Mohanam. (Hindustani equivalent is Bhoop or Bhopali)

(Usually, the the next octave's Sa is also included for completion and hence the Arohanam will be more correctly given as Sa-ri-ga-pa-dha-Sa. Similarly, the Avarohanam is given by Sa dha pa ga ri sa. You will notice that almost all ragams start with the key Sa. Also, from now on, we will omit saying 'Ri 1' or 'Ri 2' etc. IF THERE IS NO AMBIGUITY AS TO WHICH KEY WE ARE USING.

If we used Sa, Ri, Ga, Pa, Ni, Sa then we get Ragam Hamsadhwani.

If we used Sa, Ri, Ma, Pa, Dha, Sa then we get Ragam Suddha Saveri. (The Hindustani equivalent for this scale is Rag Durga)

If you have a keyboard try to play just these keys and see if you can get a feel for the identities of these Ragams. For example, in Mohanam, the jump from Ga to Pa or for that matter Dha to upper Sa is quite characteristic. Besides Karnatic and Hindustani music, a lot of Oriental tunes are based on the scale of Mohanam!

(3) The five note scale, such as Mohanam, is called a Pentatonic Ragam. The Indian equivalent term is 'Oudava Ragam'. Similary, the six note Ragam is called Shadva Ragam in India or Sextatonic in Western terminology. And the seven note Ragam is called Septatonic or Sampoorana. While the Ragam Mohanam is pentatonic with an implicit assumption that Arohanam and Avarohanam are reverses of each other, other asymmetric possibilities are allowed.

A ragam can have five notes on the way up (in Arohanam) and seven on the way down. (Avarohanam) For example, you can have a ragam which is exactly Mohanam in terms of Arohanam (Sa ri ga pa dha sa) but is Kalyani (Sa ni dha pa ma 2 ga ri sa) on the way down. This oudava - sampoorana Ragam is called Mohanakalyani. So you can have oudava-oudava, oudava-sampoorana, sampoorana-shadva etc. combinations. (Melakarta Ragams are of course, Sampoorana-Sampoorana) Also, the Avarohanam need not be the reverse of the Arohanam. For example, you can have a ragam that goes Sa-ri1-ma1-dha1-ni2-Sa (Arohanam) and Sa-ni1-dha2-pa-ma2-ga2-Sa. (Avarohanam) A good lot of ragams are however symmetric. (The same keys used to go up the octave or down the octave)

Once you have chosen the keys, you are restricted to play only those keys, however you can play them any way you want. You can compose a phrase that goes Sa-ma1-ma1-dha1-Sa-dha2-dha2-ga2. You can skip notes if you wish.

(4) Some other ragams, instead of going up or down simply, can go up or down in a zig zag manner - such as Sa-ri1-ma1-ga2-pa-ni2-dha1-sa etc. That is, you cannot simply go up in scale by merely pressing the keys, but you should spiral to the top of the scale. There are not too many such ragams, but such a meandering structure is called 'Vakram', which literally means crooked. This is an additional constraint imposed on the Ragam, besides the key selection.

(5) In some other instances, it may not be easy to define uniquely the Arohanam and Avarohanam of a ragam. Many Arohanams and Avarohanams (i.e, definitions) can exist for one ragam itself. An example of such a Ragam is Ananda Bhairavi. Of course, those Arohanams and Avarohanams will be close to each other and won't be radically apart. This situation exists especially when we try to extract the Ragam equivalent of folk melodies or alien tunes.

(6) And finally here is a confusing possibility. There can be two Ragams which have identical Arohanams and Avarohanams, but DIFFERENT MICROTONAL ASSOCIATIONS or Gamakams ! The only way to tell these two Ragams apart is to sensitize your ears to the differences to the Gamakams. Of course, you can never possibly play them on the keyboard as two different Ragams!

You can go ahead and create your own ragam by selecting your own five keys (or six or seven) following the above rules and name it after yourself. (But make sure it doesn't already exist !) However, if you created your own pentatonic-pentatonic ragam, you probably did not choose just the first five keys of the octave. You might have distributed the five keys such that they were spread out in the octave instead of being bunched together, just so that your ragam sounded better. In fact, such subjective criteria have given resulted in only a few Ragams being popular.

Mathematically, there are many, many ragams possible. Choosing five, six or seven keys out of possible twelve keys gives rise to a huge number of combinations. Fortunately, many of the possibilities have been deemed 'boring to the ear' by musicians throughout history. Only about six thousand or so ragams have been even cataloged and of these, only about two hundred or so are even used these days. A ragam's popularity can go up and down, depending on people's taste and the existing political climate of the Karnatic music caucus. So, it is really not a tremendous task to learn about fifty or so of the more popular ragams and be good at identifying them, if at least to impress your friends.

It is always possible to break down any song, even the non-Karnatic music songs into its constituent Swarams and define a corresponding Ragam. Even 'Baa baa black sheep' can be broken into a Ragam. Musicians more clever than we are have done such things and created Ragams out of truly Dravidian folk melodies such as 'Aadu Pambey' (the snake song) or Kavadi Sindhu songs like 'Nandavanathil or aandi' and created ragams like Ananda Bhairavi or Kurunji. Sometimes, the ragam corresponding to songs like 'Baa baa black sheep' may not have enormous scope to create a lot of 'characteristic phrases' and thus limiting creating any more songs based on the ragam.

In general, if two songs sound strikingly similar, the odds are they are based on the same set of notes and thus in the same Ragam. Their basic Ragam is identified typically by pattern recognition, if you are not willing to do detailed decomposition into the constituent keys of their scale.

The basis of Ragams is (1) the use of a restrictive number of keys in an octave (2) go up and down in the octave in a prescribed manner. (3) And yes, throw in the appropriate microtones. These generate specific melodious personalities. The term microtones presents a major difficulty in understanding the totality of the concept 'Ragam'. How exactly can one specify which microtones are involved ? What is the best way to 'notate' the millions of intermediate frequencies ? Instead of getting very analytical about 'microtones' Karnatic music just gets away by omitting a precise definition of a Ragam. In some sense, the 'Arohanam'-'Avarohanam' - this is the ascending sequence and this is the descending order definition of a Ragam is only an 'operational definition' at best. Since the 'associated microtones' or 'Gamakam' cannot be defined numerically, it has also become fashionable to simply say that a Ragam is a 'Mood' or a feeling or an emotion, if you can even relate to such unmusical terms.

Another way to define a Ragam is by analogy or how it should 'sound' like. And compare it with an established historical 'standard' or 'primitives'. It is always much easier to sing the 'Gamakams' associated with the Ragam - produce the basic patterns - rather than Fourier analyze it. A ragam is alternatively defined in terms of its 'characteristic musical phrases'. These characteristic phrases are called 'Pakads', (in Hindustani music) literally meaning 'catch' phrases.

All these lend a certain amount of mystery to the concept of Ragam. Like blind men trying to figure out an elephant, we are supposed to only know 'a part of the personality' of a ragam. Never its wholeness. We can only know so many 'characteristic phrases' of a ragam, not a complete set of them, even if there exists such a complete set. One song may have twenty of them. Another song in the same ragam might use just ten of them, but a ten other new ones. Musicians are always trying to create newer and newer 'characteristic phrases' to bring out newer and newer aspects of the ragam. One might have thought that they would have composed every possible phrase in the Ragam Shankarabharanam. But people are still making new melodies in this centuries old Ragam ! We will perhaps never run out of tunes in this Ragam.

The easiest way to identify a ragam then is by analogy and trying to figure out if there is a recurring characteristic phrase. Figuring out a Ragam has always been a natural thing for a Karnatic music enthusiast, especially if the Ragam happens to be an obscure one. It is almost like solving a crime. Some of the ragams can be so distinctive that you can recognize them when only two or three notes are played, thanks to the characteristic microtones.

Sometimes, life is not quite simple. Our definitions of the term Ragam may be violated. Some talented musicians might introduce extraneous notes occasionally into a well-defined ragam, for nice musical effect. Such a process is called 'Misra'fying. You can

have a ragam Sivaranjani played pure - this is a pentatonic ragam. Or you can have Misra Sivaranjani where you occasionally introduce a sixth or seventh note not prescribed in the definition of the ragam. Note that this requires expertise. If you or I play Sivaranjani and try to Misra-fy it, we may go so far off the original ragam that we might sound horrible - resulting in 'besur' or 'Abaswaram'.

Equally incredibly, we have other violations as well. Ragams like Sindhu Bhairavi and Kapi are often played with many more notes than just the traditional maximum of seven. On the low side, people have laid claims to Ragams with just four notes. Again, let your ears be the judge.

Play some classical sounding music and try to see if any particular Ragam thrills you. Anything that turns you off completely ? Play instrumental or light classical music at first before embarking on a heavy-duty vocal piece. Is there a piece that moves you? Puts you in a sublime mood? Helps you drive your car ? Goes well in the background when you cook?

The reason for asking these questions is to figure out a little bit about the psychoacoustics. While I do not believe that a particular Ragam could inherently be an 'Angry' Ragam or a Midnight Ragam or bring the rains or tame an elephant, Ragams could very well produce individual psycho-acoustical effects.

# **A GENTLE INTRODUCTION TO SOUTH INDIAN CLASSICAL (KARNATIC) MUSIC**

## **PART III of IV**

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### **LET US MARCH ON!! THE CONCEPT OF 'TALAM'**

If frequency and related concepts like tone, scale and octaves form an important ingredient in music, the other equally important element is time and related items like speed, rhythm, meter etc. In fact, a musical piece is nothing but a source of sound emitting soundwaves as a function of time. If you looked into the Western system of musical notation, (the 'Staff notation') you would have noticed that frequency is notated on the Y axis and time is given in the horizontal axis.

Let us forget about the frequencies etc for this chapter and see how a melody progresses in time. The first concept is 'speed'. Any song, even 'Jana gana mana' and 'Roop tera mastaanaa..' has a prescribed speed. 'Roop tera..' probably lasts about four minutes and if you sing it much faster or slower, it might even sound funny. (You must have played some old records at a slow speed or fast speed and had a good laugh when you were small) The Western music and Hindustani music recognize various degrees of speed or tempo, all the way from very, very slow to ultra fast. However, in Karnatic music, we do not talk about ABSOLUTE speed - there is no connection to an external clock. This has often led to arbitrariness in speed when songs are performed. Some musicians become well-known for slow rendition of songs. And perhaps an equal number have become equally well-known for their fast rendition of perhaps the very same songs. History and tradition have been the guidelines for the 'speed' of a Karnatic piece. Since the concept is hardly invoked, we will not discuss it any further. We will not impose an Adagio (one of the many Western music tempos) or Vilambit (a slow speed used in Hindustani music) on Karnatic compositions.

Once the speed is chosen, Karnatic music is reasonably strict about keeping the speed constant - you should not slow down or speed up during the course of a song unless mandated. However, Karnatic musicians occasionally double and even quadruple their speeds relative to their fundamental speed during the course of certain pieces, just to build up the mood. In fact, lately, there have been songs rendered in 'seven speeds', much like a Hamilton Beach blender. The basic speed is referred to as 'First kaalam', literally meaning, first speed and correspondingly, when the baud rate is doubled it is called 'second kaalam' and when quadrupled, it is called 'third kaalam'.

Let us now look at the other concepts such as rhythm and meter. Rhythm is probably the most fundamental aspect of music. Ancient civilizations beat their drums much before they made their harps and lutes. Repetitive sound patterns, such as the pulsation of the

heart, are so primitive that everyone can relate to them. When we sing 'Roop tera mastaanaa..', even if it is just the first line, we feel the rhythm - sometimes even if we forget how exactly the tune went, we could still recall its rhythm. Amazing, isn't it.

We can tap our feet or pat our thighs or clap as we sing 'Roop tera mastaanaa..' How many times did you pat or clap during the first line of the song ? How about 'Baa baa black sheep' or 'jana gana mana' ? How many times did you 'beat' during the first lines of these pieces ? What you have been doing by tapping or patting is simply 'meter'ing the song to count how long each line lasted - sort of counting minutes. Let us now look at why such metering is important.

Songs are 'structured' - they have lines, stanzas and melodic phrases, much like prose having paragraphs and sentences and words.

A good way to write 'Roop tera..' will be,

Roop tera

Mastaana

Pyaar mera

Deewana

Each of the above lines is a musical phrase or melody in itself and seems to last about TWO beats. By the time you finish singing the above four lines, you would have counted EIGHT beats. There is a cyclical repetition. At the beginning of the first (and the third, fifth and seventh) beat, a new musical phrase begins. If the time interval between your clapping or beats is  $T$  seconds, then each small melody lasts  $2T$  seconds and the entire opening stanza lasts  $8T$  seconds. In fact, if you went through the rest of this song, you will see that there are some longer melodies lasting  $4T$  seconds.

Now, on to our next example:

Baa baa black sheep (Four beats)

Have you any wool (Three beats)

Yes sir, yes sir (Four beats)

Three bags full (Three beats)

difficult to figure out. The melodic structure lasts either three beats or four beats. We can therefore conclude that the periodicity is seven beats, with a substructure of Four-beats and Three-beats. Or put another way, the melodic phrases last  $7T$  seconds and even here, there seems to be two sub-melodies in one phrase lasting  $4T$  and  $3T$  seconds.



In the final analysis, we can say that 'Roop tera mastaanaa..' is set to a Four-beat cycle (Two beats would actually do, but two is too small a number to define a beat cycle) and 'Baa baa black sheep' to a Seven-beat cycle. The periodicity of the four beat cycle is 4T and that of the seven beat cycle is 7T. It might sound trivial, but we cannot hope to play 'Roop tera mastanaa..' using a 7T cycle (if we do so, we might end up chopping the melody in the middle to fit our beat cycles) and by the same token we cannot hope to play 'baa baa black sheep' using a four beat cycle.

Let us summarize our concept of beats and cycles and metering. At the beginning of each beat cycle, a new melody seems to emerge. (Melodic phrases emerge even in the middle of the cycle in both the songs; however, fresh phrases almost always begin with each new beat cycle) In fact, if 'baa baa black sheep' happened to be a Karnatic song, it is made up of nothing but melodies which are 7T (could even be 14T or 21T) long in time. In fact, the number 7T is some kind of a 'characteristic time constant' for this song. Therefore, we see that each song in Karnatic music is not only set to a Ragam, but is also composed of a series of melodies which are of specific duration to fit a beat cycle.

So if you are a music composer, you should select a beat cycle too. Let us say you selected a five beat cycle - your melodies then are constrained to last 5T or 10T or 15T etc long, but not 3T or 7T. This is precisely the basis for Talam. A Talam is essentially a beat cycle. The seven beat cycle is a seven beat Talam and so forth.

An advanced aside ! - In general, a new melody NEED NOT begin JUST at the start of a Talam cycle. In fact, you can choose any point in the Talam cycle, (any beat, or even in between the beats) as the starting point to begin your new melodic phrase each time. This point in the Talam cycle is called 'Eduppu' in Tamil.

The simplest cycle has only three beats per cycle - called Roopaka talam. By the way, we do not consider a simple TWO beat per cycle as a Talam. Even though Four beats per cycle is a legitimate Talam, Karnatic music does not consider it. Instead, the popular 'binary' talam is interestingly an eight beat cycle, called Adi Talam. You would have sung the entire first four lines of 'Roop tera..' by the time you completed one cycle of the Adi Talam. A version of the five beat Talam is called Khanda Chapu. There are six beat Talams although sometimes you may be able to get by with just two cycles of the Three beat talam, Roopakam. One version of the seven beat cycle, (which is appropriate for 'Baa baa black sheep') is called Misra Chapu.

Another quick aside: Misra Chapu and Khanda Chapu are quite popular in Karnatic music. 'Misra' in the context of Talam means seven and 'Khanda' means five and 'Chapu' denotes that the cycle is not uniform ! For example, Khanda Chapu goes one-two, one-two-three - here there is a subdivision of the cycle itself into two parts. The first part with two beats last for a different duration compared to the second part with three beats. So the duration is 2T1 plus 3T2 and not just 5T !

There are more complex Talams than what I have mentioned thus far. There are complexities either due to a large number of beats per cycle (such as eleven, thirteen,

umpteenth) or due to their internal structure with subdivisions (like the 'Chapu' Talams) Imagine composing musical melodies which perfectly last a time cycle of thirteen beats ! As improbable as it may sound, talented Karnatic musicians in fact choose to compose and perform in extremely complicated and long beat cycles of twenty plus beats per cycle. Legend has it that (of course, in ancient times when kings and queens had nothing to do but to get entertained) a musician sang in a 79 beat cycle and utterly humiliated a rival musician.

However, the vast majority of the compositions are in the simple Talams Roopakam and Adi. You can refer to erudite texts on the other less known Talams. In fact, the morphology of Talams rival that of the Melakarta scheme and one can get very sophisticated.

The Talams are 'put' or 'kept' (that is, the beats are counted) by various time-honored ways. Even though at first it might look funny, the familiar way still is to tap one's thighs and sweep with the right hand while squatted. Ask your musically inclined friend to teach you how to 'put' simple Talams like Adi and Roopakam. It is really a good idea to 'put' Talam when you listen to a song. You can not only learn 'keeping talam' in just a half an hour or so of trying, but also see that you are already a step above your friends who don't know about it. In fact, although it can be quite annoying at times, you will see that many, many people in the audience would 'put' Talam in a concert and 'participate' - such feedback is often expected and appreciated by the artistes. In real concerts, the rhythm is kept also simultaneously by percussion instruments like Mridangam or Ghatam.

## **THE EXOTIC WORLD OF KARNATIC MUSIC**

Thus far we examined (rather lightheartedly) the basic tools of Karnatic music like the Ragams and Talams. It is now time to go to our stereo systems and listen to Karnatic music with an entirely new mindset. You can start off with classical based movie songs or play instrumental music. Can you see the names of Talams and Ragams on the CD jacket ? From the name can you figure out whether the Ragam is a Melakarta Ragam by looking up Table IV or a child Ragam ? Do you know the keys used in the Ragam ? More interestingly, do you have two songs in the same Ragam ? If so, can you see the similarities ? Can you correctly identify your favorite melodic phrases which occur in a musical piece EACH TIME THEY OCCUR ?

Karnatic music - the hard core classical music, that is - is divided into two broad areas. The first one is the realm of pre-composed music and the second one is improvisation or creative music. In Indian terminology, the pre-existing compositions are called 'Kalpita' (literally meaning 'that which is taught') and the creative (improvisation) aspects are called 'Manodharma'. Every performing artiste learns both the aspects of classical music. He or she not only has a repertoire of several (sometimes hundreds) pieces of well known songs, but he or she also knows how to create music.

One easy way to improvise is to take an existing song and distort it ! Just look at the way the American national anthem is sung by various artistes in their own unique way ! But

Karnatic music tradition has reasonably stringent guidelines on such 'liberties' and where to improvise.

In the first ('kalpita') part, the pre-existing compositions range from the very simple to the very complicated pieces. There are Bhajan type songs, dance songs, love songs and songs with a lot of vocal gimmicks. Students of music start with such pre-existing compositions, train their voice, assimilate the 'moods' of Ragams, be comfortable with Talams and finally the training wheels come off and they move into the territory of improvisation, where they start making their own melodies as well. Some really talented musicians have whopping careers as pure 'composers' whose songs are performed by other musicians. By and large, most of the famous Karnatic musicians have left their marks not only as performers but also as creators.

Most compositions in Karnatic music have three parts to their body. The first two lines of the song (sometimes just one) is called Pallavi. Like 'Raghupathy Raghava Raja Ram...' or 'Roop Tera Mastana' they occur over and over, especially after each stanza. Usually, the Pallavi is followed by two more lines (sometimes just one more). 'Eeshwar Allah Tere Naam..' in Raghupathy Raghava Raja Ram is an example. This portion is called Anu Pallavi. This is sung at the beginning for sure, but sometimes even during the end of the song, but not necessarily after each stanza. The stanzas of a song are called 'Charanam'.

So, a song unfolds as follows:

Pallavi

Anu Pallavi

Charanam 1 followed by Pallavi

Charanam 2 followed by Pallavi

Charanam n followed by Pallavi

Pallavi

Anu Pallavi (optional)

Pallavi

end of song.

Typically, the Pallavi is set in lower tetrachord and in the lower octave (this is not a strict rule) and Anu Pallavi goes to the upper keys and to the next octave as well. Notice this in the song 'Raghupathi Raghava.'. The Anu Pallavi, 'Eeshwar Allah ..' goes to higher frequencies.

Given all this, let us see how Karnatic music education is imparted to the students.

## **THE BEGINNING STUDENT**

(Learning the simple elements - the 'Kalpita' aspects)

If you are a Karnatic music lover and if a good teacher happens to be around, try to LEARN Karnatic music formally. Seriously. You may not be gifted like some other people and your voice might sound like a vacuum cleaner (many famous Karnatic musicians have lousy voices) - and you may think you are 'tone deaf' or have no musical aptitude. But none of these should come in the way of your attempting to learn music. If people can be trained to learn foreign languages or to ski or to become software programmers, they can be equally well trained in Karnatic music. Even if you don't become a concert grade musician, you can learn enough to develop a deeper appreciation for music. Nothing like hands on experience.

In the olden ('Gurukulam' or 'Gharaana') days, music was handed down from generation to generation orally and the emphasis was heavily on memorizing and relentless practicing. (Even now practice is a major aspect of learning) These days, Karnatic music teaching has become more modern and streamlined and less painful for the students. Students are taught the theoretical and analytical techniques as well, instead of being forced to regurgitate what the Gurus teach.

The first thing that happens when you start to learn music is figuring out your characteristic octave. In Karnatic terminology this is referred to as 'finding out one's sruti' - note that we are now using the word 'sruti' in a completely different sense. This is because, everybody has her or his signature octave which need not begin at 240 Hz. The student is asked to sing out Sa - Pa - and then the sa of the upper ('Tara') octave. From this, the teacher extracts the range of the student's octave.

After the octave is figured out, it is then 'captured' on a 'drone' instrument called 'Sruti box' or a 'tanpura'. By 'capturing' we mean that these instruments are tuned to produce those three notes at the appropriate frequencies. If the student's standard octave begins at 260 Hz, the sruti box will play the 'Sa' at 260 Hz, Pa at 367 Hz and the upper Sa at 520 Hz. Throughout the session, the 'drone' instrument will keep playing these notes. Although this may be quite annoying at the beginning, it is a necessary thing. Sometimes, after a lot of singing, people can 'lose' their 'srutis' and instead of producing the Sa at 260 Hz (or at whatever happens to be the person's sruti) they can go completely off their octave and scales. At times like these, you can tune yourself afresh using the drone sounds of the sruti box and come back to your octave. (By the way, for the purpose of writing I am assuming the student to be a male. It can very well be a woman student too. No sexism implied) Not only do beginning students tend to lose their 'sruti' - even experts, sometimes in the middle of a big concert can go completely off their sruti and octave and could sound quite miserable.

If you happen to have a sruti box or a tanpura, it is a lot of fun tuning it to your octave or someone else's. Try it. If you get an opportunity, jump on a concert stage and pluck away at a tanpura, especially if the musician happens to be a big shot. (Just remember not to fall asleep during the concert) The sruti box or the tanpura, by its constant droning also adds an element of harmony to the Karnatic music.

The first bunch of music lessons concern with the production of 'notes' - much like Julie Andrews teaching the Sound of Music kids about Do re mi. (there are corresponding Indian movie songs as well about Sa ri ga ma pa) The emphasis here is for the student to stretch his voice to produce different frequencies and at will. A student-friendly scale like the Mayamalavagoulai (Melakarta # 15) is chosen where Keys 1, 2, 5, 6, 8, 9, and 12 are the Sa, Ri, Ga, Ma, Pa, Dha, Ni notes. The upper 'Sa' is always added. (Thus we produce EIGHT notes when we sing, although the Ragam has only SEVEN notes. Among other reasons, the eight-ness makes it easy to time this sequence in a binary, Adi Talam which has an eight beat cycle) This particular Ragam is chosen because the notes are 'spread out' across the octave, instead of subtly varying, so that a beginning student can reproduce them easily. The notes are drilled into a student in a variety of excruciating exercises, so that at the end of the lessons, when asked, the student can utter a 'dha' or a 'ri' at the exact frequency. (of course, in his signature octave)

The initial lessons are purely on tone reproduction. Ragams and microtones come afterwards. Initially, the student only learns the solfege notation - a bunch of sa ri ga ma s - he is not taught any text or lyrics. There will be also exercises on keeping Talam.

Then the student graduates to the simple songs called Geetams - the nursery rhymes of Karnatic music. These are often set to mild Ragams - again, the facets of the Ragams are hardly emphasized at this point. The idea is to sing 'in tune' following the teacher. Usually the Geetams are only a few lines long and they do not adhere to the Pallavi-Anu Pallavi-Charanam structure always. The Solfege notes (Swarams) are taught and sung out first and then the lyrics (lyrics are called Sahityams in Karnatic music) are sung out afterwards.

The teacher might first go,

'Ma pa da sa sa ri'

and sing a line of text to fit it.

'Sreee Gana Naada'

(This can be fitted to a three beat cycle Roopakam, since there are six notes.) This is a Geetam in the Ragam Malahari, a derivative of Mayamalavagoulai and is usually the very first Geetam anyone learns.

If you think about it, there are several ways to express or sing out a 'tune' (1) using the lyrics or text (2) humming using syllables like 'la la' or 'aaa' or 'whatever'. You will see

that this forms the basis for what is called 'Alap' or 'Alapanai' and lastly (3) you can 'decompose' the tune into the corresponding notes and utter just the Solfege notation - this is called Swaram singing. This version of producing the tune is useful especially if you are learning to play an instrument where you don't care for lyrics anyway.

## **THE INTERMEDIATE STUDENT**

Once the basics like singing in-tune, keeping Talam etc are mastered, the student is then ready for the more serious compositions. At this point, in addition to learning a particular song, the student is also trained to think in terms of Ragams etc. Even at this point, improvisation is not introduced. Faithful following of the Master is strongly emphasized so that pre-existing songs are reproduced the way they were meant to be - tune, Talam and all. However tempting it may be and however nicer it may actually sound, it is a big no-no for the intermediate student to introduce his own 'stuff' and distort the song. You cannot improve on a perfection like a Beethoven Symphony or a Thyagaraja Composition. (What is your reaction to this ?)

The student moves on to the next set of songs called 'Varnam's. A Varnam is a song with minimal amount of text. But most syllables will be stretched and twisted quite a bit and a lot of vocal acrobatics will take place. For example, a simple word like 'Swamy' might be stretched to several beats (in terms of time) and might go through several notes (in terms of frequency) and might actually sound like:

"Sw a a a a a m e e e e e .."

The idea here is to teach the student a little bit about the Ragam structure, its characteristic phrases, microtonal variations and so on and of course, to be able to train his vocal chords and reproduce such features of the Ragam. The Varnam is also an exercise in maintaining the Talam.

The Varnam consists of the Pallavi - Anu Pallavi - Charanam structure somewhat. Interspersed with this will be a lot of plain 'notes' or 'swarams' in the Solfege nonsense syllables. That is, there will be a lot of Sa, ri, ga, ma stuff sung out explicitly throughout the song. The structure of Varnam is approximately,

Pallavi

Anu Pallavi

Initial Swaram (called 'Muktayi Swaram')

Pallavi

Charanam 1

Swaram 1 Charanam 1 (These Swarams are called 'Chittaswarams')

Swaram 2 Charanam 1

Swaram n Charanam 1

There is only one 'stanza' (Charanam) so to speak. Even this stanza is usually only one line long. The basis for the introduction of Swaram in these songs is to teach the student the main phrases of the Ragam without obscuring the tune with lyrics. As the song progresses, from Swaram 1 to Swaram n, the Swarams get longer and more complicated. It takes longer for the student to learn the latter Swarams. All Varnams are pre-composed, including the Swarams.

Another interesting purpose of singing 'Varnam' is to practice it in the basic, double and even quadruple speeds to get the hang of the Talam correctly. (and also to push the student to the limit of his learning curve) Varnams are usually very bright and lively pieces. There are also slow paced Varnams called Dance Varnams, essentially used in dance recitals. Instead of being in just one Ragam, some Varnams are composed as Ragamalikai, which means it is a song which uses different Ragams for its various stanzas. (usually about three or four Ragams)

Then the student moves on to the mainstream Karnatic songs. These songs are called 'Kritis' or 'Keertanai's. There are subtle technical differences between the two terms, but we are not going to quibble. The Kritis follow the Pallavi - Anu Pallavi - Charanam structure. Usually, interestingly there will be just one Charanam or one stanza rendered in the Kritis. If 'Roop tera mastana ..' were a Karnatic music Kritis, you would only sing one stanza. Of course, there are exceptions. Also, there are songs or Kritis which do not adhere to the Pallavi - Anu - Charanam format. Kritis are usually ornamental and like movie songs, they are developments of a theme. Even though they are set to a Ragam, their purpose is not bring out every aspect of the Ragam, but simply to produce a musical impact in a listener. So two Kritis set to the same Ragam might sound quite different, even though you might notice many similarities because they are set to the same Ragam. In fact, if you are not musically inclined you won't even notice that two 'kritis' are in the same Ragam.

Sometimes, in a kritis, the first lines will be varied systematically as the singer repeats it over and over. (This happens even in some movie songs). That is, the Pallavi will be sung intentionally in different melodies as it gets repeated. The text of the line will be the same, but the music will be different. Such variations are called 'Sangatis'. These variations or Sangatis are intended by the original composer (or cleverly introduced by some other musician somewhere along the line) and are parts of the song. If you listen to a Kritis like 'Vatapi Ganapatim' in Ragam Hamsadhwani, you will notice that the singer spends a long time mulling over the first line itself. But if you paid close attention to details, the singer is in fact varying the melody of that line over and over - in other words, the singer is producing the various 'Sangati's. Sometimes, after all the variations are done, the final version of the Pallavi could sound totally different from what one started out with. In fact, usually, the final version of the Pallavi is what is the official version of the

Pallavi from that point on - and this is the version that is sung after each stanza (charanam) subsequently. Even Anu pallavi can have associated Sangatis.

By the time a student starts to learn a lot of Kritis, he or she is already at a reasonable level of expertise. By this time, the student knows how to decompose any musical phrase into its constituent Swarams. They could easily tell you what notes make up 'Roop Tera Mastana'. At this point, the teacher no longer breaks down the lyrics (the text) into their constituent Swarams. (except when the musical phrases are very tricky) The teacher simply sings out the songs and the student tries to follow without making mistakes. It is no easy task, especially given that there could be subtle variations from Sangati to Sangati. The musical phrases, loaded with microtonal features, are simply reproduced without anyone trying to do too much analysis.

## **THE ADVANCED STUDENT - THE CREATIVE JUICES!**

After several Varnams and Kritis are learnt, it is time for the student to learn to improvise - remember the technical term for improvisation in Karnatic music is Manodharma. At this point, it is also apt to call the student a 'musician'!

In Karnatic music, improvisation is an 'add-on' to pre-existing music. In other words, you cannot distort a song like 'Roop Tera Mastana..', but you can ADD to it. There are several ways to improvise. Let us examine some of them such as (1) Alapanai (2) Neraval and (3) Kalpana Swaram.

Alapanai is essentially a free format humming. The purpose of the Alapanai is to bring out the total character of a Ragam. Alapanai is sometimes simply called 'Ragam' singing or 'Raga Alapanai'. (It is unfortunate that we tend to use the same word to mean different things in music. If someone says Ragam, it could mean a scale like Shankarabharanam or it could refer to Alapanai. You have to know the context)

The Alapanai is a preamble to a kriti. For example, if the musician is going to perform a song in the Ragam Shankarabharanam, he or she would do an Alapanai just before the song. The musician would try to sing out as many characteristic phrases as possible to enunciate the features of Shankarabharanam. This is a place for him to show his creativity. He would use no texts or words; instead Karnatic musicians use nonsense phrases like 'Thadhari na' and so forth to hum out the tune. (Hindustani musicians use simple 'Aaaaaa') The Alapanai is not set to any Talam either. So there are no constraints on how long the musical phrases are. The Alapanai can be micro-mini, lasting just a couple of minutes and equally well, it can last nearly a half hour.

Just how exactly does one go about doing the humming and bring out the essentials of a Ragam ? There is no clear answer to this question. However there is a method to Alapanai singing, even though there is no prescribed algorithm to perform it. The artiste usually starts out in the lower part of the scale of the Ragam, constructing short melodies in that subset of the octave. Then as the Alapanai proceeds, he would meander into the higher notes (this meandering is technically called 'Sanchaaram') - even here he might use



just a subset of the scale - and eventually reach even the higher octave. Then he would make up tough melodies, essentially in the very high end of the scale and then would come down in scale slowly and make more complex melodies in the lower part of the scale and would grind slowly to a halt. By the way, this need not be the case in every Alapanai.

Listen to an Alapanai and see if you can identify when the musician is making melodies in the lower part of the scale, when he moves to the higher notes, when he makes complex melodies and finally when he asymptotically comes to a stop. My view is that an Alapanai should be sung before EACH song. It is always nice to elaborate the Ragam to be performed. Also, in a concert situation, an Alapanai lets a musician transition from one song to the next smoothly. Imagine an intense musician performing Shankarabharanam. He cannot abruptly move on to the next song set in perhaps Desh. Here a little Alapanai in Desh could smooth him into the new Ragam.

Even though the Alapanai is an improvisation, very few musicians would walk to the stage cold and start thinking about the Alapanai. The odds are they would have practiced at least some part of the Alapanai leisurely at home or would have rendered them in some other previous occasion. In fact, if you followed a musician from concert to concert, and if he performed an Alapanai in Shankarabharanam in both the concerts, you will see that he actually repeats a lot of phrases. A musician is not graded on how impromptu and extempore his rendition is, but more on what beautiful melodic phrases he comes up with in the Alapanai segment and if some of them are truly 'out of the world' phrases.

Neraval is just a technical term given for improvised variation of a line in a song. Typically any one line of the song is chosen and its melody is varied intentionally over and over. Remember, this is exactly the definition for the term Sangati, except that the Sangatis are parts of the original song, introduced by the composer - and they also tend to occur only in the first couple of lines of the song, namely in the Pallavi and Anu Pallavi sections. In 'neraval' you typically choose a line from somewhere in the middle and park out there. For example, you can do a Neraval in the song 'Roop Tera Mastana..' by choosing a line somewhere in the middle - such as 'Ankhon se ankhen' - and endlessly vary the melody to bring out the features of the Ragam. Remember also that since neravals are variations of a line in the song, one must strictly adhere to the Talam structure and the improvised melodies should last appropriate time intervals.

The third avenue for creativity is what is called Kalpana Swaram - or 'creative Solfege note sequence formation'. Here the musician makes up Swaram sequences (fitted to the Talam, of course) in the Ragam. Sometimes the sequences can be simply mathematical (like Sa ri ga, ri ga ma, ga ma pa...) and some other times very interesting complex patterns.

These 'Swaram passages' are made up typically near the end of a kriti. The musician usually launches into "Swaram singing" from a particular point in the song, usually at the Pallavi, after the entire song is sung. At the end of each Swaram passage, he would come back to the Pallavi. The 'landing' back to Pallavi should be smooth. For example, if the

Swaram sequence ended in the note Ni and the Pallavi started in Ga, there is a perceptible discontinuity and such things are not allowed. The Swaram sequence should more appropriately end in a Ri or a Ma to be able to smoothly go into the Ga of the Pallavi. Also, at the end of each Swaram passage, it is not necessary to repeat the entire Pallavi line. Sometimes just a word or two of the Pallavi is sung.

Of course, it is not necessary choose the Pallavi as the place to 'home in'. Other lines, especially in the middle of the stanza are often chosen as the launching points for Kalpana Swaram blitz. Even though the Kalpana Swaram sounds very constraining (in terms of sticking to the Talam or finishing the Swaram sequence at the appropriate 'note') several performers earn a name for themselves in building up incredibly creative Swaram sequences. There are enough freedoms - for example, the Swarams can be in single speed or in double speed or higher, adding an element of tempo-building to the performance. Sometimes, the musician might make up a 'structure' for the Kalpana Swaram. He might start off with a long Swaram passage and as he progresses in the Kalpana Swaram, he might shorten his sequences to smaller and smaller phrases - and might eventually end up in just single notes - at which point, he would conclude his Swaram singing by launching into a long, final, climactic Swaram passage lasting several Talam cycles. Somewhat like a cadence. Usually, after the Kalpana Swaram, the song is concluded.

So, to summarize, let us see the structure of a Karnatic song ('kriti'), in light of all the Manodharma or improvisation components.

Alapanai (optional and creative component)

Pallavi - Sangati 1

Pallavi - Sangati n

Pallavi - Final Sangati

Anu Pallavi and its Sangatis

Charanam

Neraval of a line in Charanam (optional and creative component)

Rest of the Charanam, followed by (final Sangati of the Pallavi)

Kalpana Swaram (optional and creative component)

# **A GENTLE INTRODUCTION TO SOUTH INDIAN CLASSICAL (KARNATIC) MUSIC**

## **PART IV**

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### **THE CONCERT MUSICIAN**

If you have ever been to a Karnatic concert, you would have noticed that the ensemble sitting on the stage is usually only a few people strong. If the main performer is a vocalist (let us assume this, for the time being !) he is usually accompanied by a violinist and a Mridangam player. If he is lucky, there is also a Ghatam player tapping on a clay pot for accompaniment. There is, of course, a person strumming the Tanpura or the Sruti box and if the musician is a senior artiste, some of his disciples too sit on the stage and sing along - sometimes camouflaging the flaws of the Guru and reaching higher notes their Gurus cannot reach.

It is always a dream of every student to become a performing musician and to be top notch. But before being let loose on concert stages, they still have one final plateau of excellence to reach - the ability to perform what is called a 'Ragam, Tanam, Pallavi' or RTP or simply 'Pallavi'. (Note again, how we use the same word Pallavi to mean two different things) Ragam, Tanam, Pallavi is a total elaboration of a specific Ragam and is one hundred percent improvisation and creativity. It is the perfect place for a musician to show off his skill and mastery in enunciating a Ragam. The Ragam, Tanam, Pallavi is in fact the centerpiece of a Karnatic music concert.

First of, the musician chooses a 'strong' Ragam to perform his RTP. Oftentimes he picks a Melakarta Ragam, where the scope to make creative melodies is enormous (because they have all the allowed seven notes in the scale - remember they are all Sampoorana or 'complete' Ragams) He would also often choose a complex Talam to set his musical phrases in. Let us say he chooses Shankarabharanam and set to a Talam with a eleven beat cycle (!). In real concerts, usually the artiste does not reveal the Ragam of his RTP before hand. The audience and often, the accompanying musicians find out the Ragam just when the musician begins to play the RTP.

The first part of the RTP is simply the Alapanai of the Ragam (the word 'Ragam', is also a synonym for Alapanai, remember ?) After the Alapanai, the singer usually takes a break (and sips 'hot water' or milk kept on the sidelines) when the violinist takes over and tries to play the same musical phrases the singer just sang. This calls for a tremendous memory and ear for musical phrases. Of course, no one keeps tabs on how accurately the violinist follows the musician. The closer the violinists and the musicians are, the better. (This probably explains why specific violinist play for specific musicians because they 'know' each other well)

The second part of the RTP is called Tanam - don't confuse it with TaLam. Here the Ragam is elaborated even more. But now, the improvisation is in a faster tempo and set to a rhythm. Syllables such as 'Tum', 'Tanam' etc are used in this section (as opposed to syllables typically used in Alapanai). The violinist usually follows the musician after every passage. (unlike in the Alapanai part where he waited till the musician got done with the whole Alapanai) If instrumentalists are performing the RTP, in Tanam segment, they would play the sympathetic strings for added effect.

After the Tanam, the singer then starts on Pallavi, which in the context of RTP is just one line of text - often made up by the musician himself. He could very well have chosen 'Baa baa black sheep' as the Pallavi if he can massage the line to fit the Talam. Here, the Mridangam and Ghatam join in. The musician would embark on a series of 'Neravals' stretching the one line of Pallavi into several melodic phrases. The violinist of course follows the musician one step behind. Interestingly, at this point, the Mridangam would play when the musician sings and the Ghatam player would play for the violinist. The musician would cap it all off finally with a spate of Kalpana Swarams, by which time all the dimensions of the Ragam would have been (hopefully !) brought out.

Then the singer would break into an impromptu Raga Malika - singing Kalpana Swaram sequences in a bunch of Ragams, one after another. He chooses the Ragams in the Raga Malika to be widely apart, instead of being only subtly different. (Often 'light' ragams or Hindustani type Ragams are chosen). If Shankarabharanam is the Ragam for the RTP, then derivatives of Shankarabharanam are usually not chosen in the Raga Malika section). At the end of the Kalpana Swaram passage of each Ragam, he would sing the old Pallavi in that particular Ragam. The grand finale is when he breaks into a long series of Swarams (typically in the reverse order of the Raga Malika Ragams) and finally landing on the initial Ragam he had set out to play - (Shankarabharanam).

At this point, the singer typically lets the percussionists (Ghatam and Mridangam player) perform solo. This is called Tani Avartam or Tani Avartanam or Tani. This is also the time when the audience too takes a break and typically indulges in disruptive behaviour like chatting, rushing home or even dozing off. The percussionists grab this opportunity to perform the intricate aspects of the Talam.

A good Ragam, Tanam, Pallavi can last upwards of an hour and it is a vehicle for showcasing a singer's talent.

## **A TYPICAL KARNATIC MUSIC CONCERT**

One of the dangers on writing about a 'typical' music concert is that these days there is no clear definition of what is 'typical'. Only a few years ago, instrument solos were rare in the Karnatic music tradition. Now, they are all over the place. These days several Karnatic musicians follow the Hindustani format as well and just sing a Ragam, Tanam, Pallavi and a few additional pieces. There are of course, numerous other changes that always keep happening - some trend-setting, some others just passing fads. Let us however look at a garden variety Karnatic concert.

A typical concert lasts around three hours. And most concerts do not have a 'program' given out ahead of time. By and large, the audience does not know what song is going to be performed next, even though these days most musicians have become reasonably Westernized and 'announce' their next song and what Ragam and Talam they are set in and who composed the song.

The musician would start the concert with a fast paced Varnam. This not only serves as a warm up piece for the ensemble to synchronize, it also sets the mood for the concert. And of course, it allows the latecomers in the audience the time to find their seats and sit down before the heavy-duty songs are sung. Usually, the singers will also resort to some gimmicks in the Varnam itself - such as playing the Varnam in several speeds or adding their own Kalpana Swaram passages.

This will then be followed by a song about Vinayaka in the Ragam Hamsadhwani or Nattai. Given there are only so many songs in Hamsadhwani and Nattai about Vinayaka, you can almost predict what is coming. Then the singer performs a variety of songs - choosing them appropriately so that he has the right mix and order of Ragams, tempo and audience appeal. He would choose to express his creativity wherever by performing Alapanai or Neraval or Kalpana Swaram at the appropriate parts of the songs. Then eventually he will perform the Ragam, Tanam, Pallavi.

After the RTP, the concert winds down and tends to get 'light', where the musician plays several short, light numbers. Instrumentalists sometimes tune their instruments to a higher pitch, (That is, intentionally shift their basic octave higher) to give the concert an artificially bright mood (and also to wake up the sleeping members of the audience) These light pieces are usually called 'Tukkadas' (literally meaning 'pieces') They could be popular, recent numbers or 'trademark' songs of a particular performer or even movie songs. Many Tukkadas are set in light Ragams or rare ragams and some in Hindustani Ragams. They could be a Bhajan song, a folk song, song in an obscure language, a Tillana (which is basically a dance song, often set in high tempo, with a lot of dance steps set to syllables such as 'teem', 'takka timi', 'thaa thai' etc), or a Javali (a short, 'quick' composition) Toward the end of the concert, members of the audience usually request their choices - often honored by the musicians. Finally, the concert is officially ended by singing a brief number called 'Mangalam', usually in the Ragam Madhyamavati, but sometimes even in Ragams like Surati.

## **A VERY, VERY BRIEF HISTORY OF KARNATIC MUSIC**

Like many things Indian, even Indian music has a colorful history, which can probably give us insights into some of its numerous traditions and grammatical structure. Indian classical music, as an institution, has evolved greatly over the years - it is still in the process of evolution, changing itself at every possible opportunity and adapting itself to popular sentiment and political climate. Let us take a quick look at the history of Indian music - of course, it will be a 'quick look' and you can look in any of the references quoted at the end of this primer for an in-depth study.

Remember that in ancient India, music played a significantly larger role in people's lives compared to these modern times. Our ancestors did not listen to music in their chariot-stereos the way we do these days. Greater percentage of the population (compared to these days) composed music, performed it and even did research on it. People dedicated themselves to music. Kings and queens patronized music and had a full court of accomplished musicians. As Dr. Baghyalakshmi puts it, "The Kings went to sleep and woke up to music...". There were music competitions held every once in a while, which pitted one learned musician against another, where the degree of difficulty was so high that most of the modern day musicians would not even qualify to enter. Although these music contests produced outstanding scholarship, they were also vehicles to heap shame and humiliation on the defeated rival - an aspect which is hard for me to understand. History is also full of legends and astonishing individual accomplishments. Very high standards were established. It took a musician several decades of intense studentship (typically in a Gurukulam) before he or she could be considered a concert performer. These days after one summer, kids are already on stage 'performing' music.

Even in the early part of this century, people did not have the modern day 'high stress', 'no time for anything' lifestyle. Concerts lasted all night and people sat down and 'sustain-listened' to the same Ragam performed for the sixth continuous hour. These days we get a few minute condensed pop versions of most Alapanai on CDs and tapes. Well, I am sounding like a bitter cynic, but it should be borne in mind that the ancient texts on music (and traditional Karnatic music in general) are way, way more complex than what I have elaborated. There is almost very little you or I can add to the Indian music theory, really.

There is a staggering amount of written work on music that exists in India - right from Vedic times to the present day. A good lot of them are extremely sophisticated and seminal and boggle the mind on the level of analysis. It is easy to read just the first paragraph of one of those works and get totally lost in a buzzword-maze of "Lakshana", 'Beda', 'Grama' and so forth. These texts on music are about as tough as texts on Indian philosophy and the degree of abstraction employed can be scary. Remember that we had more than our share of mathematicians and theoretical people (and software folks !) in India who not only invented concepts like zero, but also established fascinating mathematical foundations for music. Not knowing enough sanskrit (or music for that matter) can only hamper our quest for understanding these texts. Suffice it to say that there exist elaborate frameworks on which the musical system is based. Throughout history, famous texts on music were more or less considered the 'Bibles' and the rules and formulations they spelt out were strictly conformed to and taught to students.

There is something or the other mentioned about Indian music in a variety of Indian literature. Even in the Vedic times, elements of music were recognized. Mantras were chanted using selected notes. Initially, only a few notes were used, but eventually to relieve the monotony, more notes got added. Sama Veda, the most musical of the Vedas, is almost 'sung out' even these days. For most parts, the lower octave was employed (Mandra Stayi, remember ?) Music was considered divine and was kept in the selected social circles for most parts. The earliest Ragam is speculated to be 'Sama Ragam', which

could be a derivative of the modern day Kharaharapriya. Theories and treatises began to be written - about how the primitive sound 'om' gave rise to the notes etc.

By the time the Epic period came around, the ancients were entrenched in the seven notes used in Indian music as building blocks, namely Sa, Ri, Ga, Ma, Pa, Dha and Ni. They were considered the 'Saptha Swarams' and explanations were abound regarding their deeper meaning. About the only thing that was not fixed was the exact 'frequency' or pitch (in the octave) which was used to produce each of these notes. Which 'keys' could be used to produce these seven notes ? The relationship between Sruti (frequency) and Swarams (notes) has been the focus of several theoretical works on music through the ages.

written by Bharata. This is a monumental reference for the Bharata Natya and other dance forms, but contains several chapters on music as well. The date of this work is pegged somewhere between the second century BC to the second century AD. This is probably the first work which clearly elaborated the octave and divided it into 22 keys. Bharata based his idea on a stunning scientific experiment he performed using his musical instrument (made of strings) which 'proved' that there could be only 22 basic frequencies that could be generated in an octave. He even located them in his octave and thus tuned his string instruments.

Not only did Bharata 'invent' the keys in an octave, he also gave some basic rules to scale building. He defined three major scales with the following shifts to choose seven keys out of 22:

Scale 1: 4/3/2/4/4/3/2 (This is called Shadja Grama)

Scale 2: 4/3/2/4/3/4/2 (Called Madhyama Grama)

Scale 3: 3/2/4/3/3/4/3 (Called Gandhaara Grama)

Here the word 'Grama' is simply a synonym for a scale. This kind of algorithm is somewhat similar to the Western Major/Minor algorithms. In addition to these principal algorithms, he also derived seven secondary 'scales' per algorithm - each of these derived scales was called a 'Moorchana' (literally meaning 'fainting'). From these Moorchanas, using some other rules, he derived even more scales which could have less than seven notes (called 'Tanas') which eventually led to what could be called Ragams ! Phyooo ! It isn't clear whether Bharata used the term 'Ragam' in the sense it is used these days.

The interesting point is, Bharata's theory has been pretty much the guiding principle for subsequent musicologists through history. Various theories were framed to understand the divine and religious nature of the seven notes. There were theories to assign each note to a body part which produce sounds, like nose, throat, stomach, head etc. Yet another theory suggested that the sounds of each note matched those of common animals like Sa for peacock, Ri for ox, Ga for Goat, Ma for crane, Pa for Cuckoo, Dha for horse and Ni for elephant. All this might sound very primitive, but believe me, these theories quickly

go into extremely complicated mathematical formulations. Some people have even suggested formulas to generate millions of Ragams!

The next major work to hit the scene after Bharata's work was Dathilam. The exact period of this work is not firmly established. Here too, the author sticks to the 22 sruti per octave formalism and even goes to suggest these 22 srutis are the only ones a human body could make. (This view was expressed again by another musicologist of the thirteenth century of name Saranga Deva in his famous work Sangeeta Ratnakara - in fact, Sarang Deva was an expert in Ayurveda as well and goes on to give an Ayurvedic basis for the 22 sruti octave)

There were other seminal works such as Brahhaddesi (Ninth century AD) written by Matanga. He probably takes the credit for the emergence of the term Ragam, although the term had been used by authors before him. Matanga was the one who explained it and helped 'define' it. Interestingly, around the same time, the native South Indian music also dealt with terms like 'Pann' and 'Paalai', which can be construed as the South Indian equivalents of 'Ragam'. Tevaram and Silappadhikaram describe several such 'Ragams' and in fact, we have already seen that Ilango Adigal, the author of Silappadhikaram has described the prevailing Tamil algorithms to build scales. (called Ilikkiramam) It is quite possible that Ilango Adigal and the composers of Tevaram and South Indians in general were aware of the all pervasive work of Bharata's, 'Natya Sastra' (Quite a lot of cultural exchanges took place between the South and the North, contrary to what we would like to believe now). However, these Tamil classics are major works in their own right and it is a pity that not too much of this is discussed in the context of history of Indian music, especially due to the large volume of musical literature in sanskrit.

Sangeeta Makaranda, a book presumed to be written in the eleventh century by a person called Narada, enumerates 93 Ragams and classifies them into masculine and feminine species. The next major work on music was Sangeeta Ratnakara written by Saranga Deva during the thirteenth century. Saranga Deva was a Kashmiri, but wrote his work while in South India.

It was approximately around this time in history that the South Indian (Karnatic) music and Hindustani music bifurcated themselves and began to evolve in two different directions. (Dr. Rangaramanuja Iyengar, suggests the twelfth century as the cut off point, in an operational sense) Even now, the Dhrupad music practiced in the North India is somewhat similar in style to the South Indian Karnatic music. For example, in Dhrupad, they use a percussion instrument called Pakhwaj, (instead of Tabla) which is similar to the South Indian Mridangam.

Sangeeta Ratnakara was a milestone of sorts. Not only was it a musicology text, but it also had detailed prescription for the performance. (The grammar and framework are usually called 'Lakshana' and the actual performance is called 'Lakshaya') We have already seen how he gave an Ayurvedic basis for the 22 sruti octave. He too performed a famous experiment (on a veena) to determine the 22 srutis uniquely. He also mapped the 22 srutis into seven Swaras. (like our Table III) and also suggested the 'mood' for the



various Swaras (Sa produces heroism, Ri - terror, Pa - love and so on) He was probably responsible for suggesting an inter-relationship between the various notes constituting a Ragam, by proposing the Vaadhi-Samvaadhi-AnuVaadhi-Vivaadhi notion of a Ragam.

A word or two about this since you might hear these terms mentioned. What is the relationship between the various notes in a Ragam ? How can we understand how the note 'Sa' is related to the note 'Ma' or 'dha' in that Ragam ? This scheme defines a concept called the 'Vaadhi' or the primary note of a Ragam or the sonant or the 'King'. And by the same token, a Samvaadhi or the 'Minister' or the second in line ('Concordant note'); 'Anuvaadhi' or the 'Servant' to give the 'proper shape' to the Ragam ('Assonant') and finally the 'Dissonant' or the Vivaadhi, or the 'enemy'. It is questionable as to how useful such dissection is; but considerable volumes have been written about such things and several hundred Ragams and their Vaadhi-Vivaadhi etc structure has been catalogued by several authors. You must remember that this theory is essentially to analyze the concept of a Ragam and explain what gives its specific appeal.

Saranga Deva, among other things, defined almost 264 Ragams, including some Dravidian and North Indian ones. He also described the various 'kinds' of 'microtones' and how to produce them. He also classified them into various categories. He defined something called 'Kaku' (a term that is hardly used these days) as a blending of melody and sruti.

More than anything else, after his work came into being, it provided a veritable guide to the performers. Any standard reference such as Dr. Bhagyalekshmy's or Dr. RangaRamanuja Iyengar's or Dr. Shringi's book has greater details on Sangeeta Ratnakara. Saranga Deva's work probably launched a whole new era in music compositions and performance. In fact, for several centuries afterwards, the theorization of music became dormant, giving importance to performance. In the seventeenth century, there was a resurgence of theoretical works - such as Sangeeta Sudha (written by Govinda Dikshitar) and Chaturdandi Prakasikam (by Venkatamakhi). The latter expounded the present day Melakarta Scheme. The author mentions the twelve sruti octave and defines the Melakarta Ragams. At that time only about 19 (out of 72) were 'known'. He proposed the Katayapadi scheme of figuring out the keys used in the Melakarta from the name. It is interesting to point out that the original names given by him for the 72 Melakartas are not the ones used these days. For example, he called the first Melakarta as Kanakambari whereas it is called Kanakanki at present. In fact, except for one or two Ragams almost all of the 72 names are quite different compared to what he had meant - although his names, as well as the present names follow the Katayapadi scheme outlined in Table V ! It must be remembered however, that this is not the only way to classify Ragams. There are several other alternate schemes and names (composers like Muthuswamy Dikshitar used alternate names for several ragams) and you can get very deeply into such things.

While such elaborate theoretical works were being written, eminent composers appeared on the scene and produced music. Annammacharya (1424-1503) a devotee of the 'Lord of

Tirupati' composed several notable pieces. He was followed by Purandara Dasa (1480-1564).

Purandara Dasa is considered the father of Karnatic music. He was a multi-millionaire ('koteeswara') to begin with, and accumulated enormous wealth in business. He was only interested in the pursuit of money and material pleasures, like most of us, till one day due to a divine intervention, his life changed one eighty degrees. He renounced his wealth and became a 'Dasa' (which means a servant) dedicating his life to serving god and making music in god's honor. From then on, his life was one misery after another and there are several legends associated with him which make interesting reading. Through all this Purandara Dasa never stopped making music. He is said to have composed nearly a quarter million songs in his lifetime, for which he probably earned quite a lot of 'Frequent Composer Mileage' awards. By the way, this works out to be about fifteen songs for every single day of his life. Even discounting for exaggeration, he was quite prolific. Several hundreds of his songs are still available, although it is likely that many of the present day versions of his numbers were set to tune by later musicians. His compositions were mostly in his native tongue, Kannada.

Purandara Dasa's songs are simple and easy for beginners to learn. He was the one who is credited with standardizing the Mayamalavagoulai Ragam as a Lesson Number One for beginning students and is said to have even composed the Sarali Varisai/Jandai Varisai (exercises in 'note' reproduction) for beginners.

The Golden Age of Karnatic music was perhaps the time when the Trinity of Karnatic composers Thyagaraja (1767-1847), Shyama Sastri (1763-1827) and Muthuswamy Dikshitar (1775-1835) made music. Interestingly, they were all contemporaries hailing from the same Thanjavur district, although it is not clear what kind of influence each had on the other. Their lifestyles, music, attitudes seem so different that it contributed to their musical styles being distinct from each other. Volumes and volumes have been written about them. So what you will find here are truly only the thumbnail sketches.

Thyagaraja is probably hailed as the King of Karnatic music, although when he was alive he shunned publicity and even rejected the King's invitation to join his court. In fact, he renounced worldly goods, (including copyrights to his songs :-)) and devoted himself to God. His songs have the raw devotion ('Bhakti', if you will) and are considered emotional. He composed songs in his mother tongue, Telugu. It is not known how many songs he has composed, but nearly a thousand songs are available at present, completely notated and interpreted. He has also composed operas. From the musicology point of view, Thyagaraja is credited with the invention of 'Sangatis' and with numerous other creative ideas in rhythm. Thyagaraja's most famous compositions are the five Pancharatna Kritis set in the Ragams Nattai, Goulai, Arabhi, Varali and Sree. Yes, who hasn't heard the song 'Endaro Mahanu bhavulu..' and not liked it ?

Dikshitar was more of an academician of music and a pedagogue. He was quite a handsome man, which perhaps explains why he had two wives. He spent considerable time in the North studying Hindustani music, which influenced him quite a bit. He wrote

his songs primarily in sanskrit (I have heard one of his songs with just one stanza in Tamil). About four hundred or so of his songs exist at present. His songs are more complex and few can sing some of his complicated pieces. His lyrics are generally praises of the God (or Goddess) in point and are much more subdued and formal compared to the raw energy of a Thyagaraja song. His songs are often slow (influence of Hindustani) and often went into several different aspects of the Ragam.

Shyama Sastry is the most obscure of the three - he is considered a wizard of rhythm and composed several pieces called Swarajatis which enunciate various rhythmic patterns.

Interestingly, none of the Trinity's students made it very big. (some of them became reasonably famous alright) This brings to point the curious teacher-student relationship that used to exist in India. Karnatic music was largely an oral tradition. Information was often lost, sometimes forever, when Gurus passed on their knowledge to their disciples - and this doesn't even count jealous and selfish Gurus who wouldn't teach everything to the disciples. It is surprising that the ancient Indians, clever as they were, did not invent a scheme to notate music.

There are several other notable composers such as Gopala Krishna Bharathi who composed in Tamil and was a contemporary of the trinity. Prior to him were other Tamil composers like Arunagiri Nathar and Arunachala Kavi Rayar. Swati Tirunal, the king of Travancore was a great composer of the nineteenth century. Among the more recent composers are Papanasam Sivan and Balamurali Krishna and the list goes on and on. Now we have come to a point in history where not only has theorizing stopped, but even composing of heavy duty pieces seem to have stopped and we are left with only performers ! Many of the references I have cited at the end give a long list of such performers - some real luminaries and some also-playeds, but most have pompous sounding prefixes like 'Shankarabharanam' Narasayya, 'Todi' Raghava Iyer and 'Mohanam' Somebody.

A more fascinating aspect of history of Karnatic music is to study its evolution, delineate the broad musical trends etc. For example, even the instruments used in music-making have changed over the years. Gone are the olden instruments which were mostly derivatives of Veena. In fact, Veena-making was a fine art and there were many, many types of Veenas serving various different purposes. The harp type instrument ('Yazh') and the ancient flutes have disappeared. Instead Western instruments such as Clarinet, Guitar, Saxophone and Mandolin are increasingly being adapted to Karnatic music. Interestingly, not many newer Hindustani instruments (such as sitar, sarod and sarangi) are used in Karnatic music.

Another historical accident was the introduction of violin in Karnatic music. It was popularized in the nineteenth century by Vadivelu, who was a member of what is considered as the Thanjavur Quartet - a set of four brothers who were very talented composers/musicians especially of dance music. (They came a little after the more famous Trinity) Vadivelu was a court musician in the Travancore Royal Court and made extraordinary contributions to dance music, besides being a master of violin. By the way,

he is said to have accompanied himself on the violin, a no mean feat ! Like his musically gifted patron, composer Swati Tirunal, the king of Travancore, he too died when he was in his mid thirties.

It is interesting to note that the violin was embraced very easily by the Karnatic music tradition whereas it is not so prominent even now in Hindustani music. Prior to violin, veena used to accompany vocalists. The present day vocal concert always has violin support, even though the violinist only plays in the shadow of the vocalist, with very few chances in the concert to show off his talents. This is quite intriguing to say the least. (Of course, the violinist can mask the vocalist sometimes and this can actually be a plus point if the vocalist has a horrible voice!)

For more detailed accounts of the recent history, happenings etc, one should read a magazine published from Madras called 'Sruti', which not only provides concert reviews, news events etc, but also gives us a peek into the prevailing 'Karnatic music' taste and culture. However, if you are a history buff, my strong recommendation will be Rangaramanuja Iyengar's delightful book. He is fanatical about Karnatic music and gets quite merciless in condemning the 'modern day Karnatic music world' - his modern day being the 1950 s ! I wonder what he would have to say if he sees people with questionable credentials writing Karnatic music primers - who even has the temerity to suggest that a Western electronic keyboard be used as a learning tool!

## **MANGALAM ! A few final words**

While you are trying to get more and more interested in Karnatic music, you should also perhaps ponder about where Indian classical music (and Karnatic music in particular) is heading toward, as we enter yet another millenium. The old generation and conservatives complain about the total degradation of the standard of Karnatic music these days, the low level of present day talent and how everything is so hurried and compromised. Oh, this age of high crime and fast computers and social mores ! Add to this the relentless onslaught of music from other cultures (notably Hollywood and Europe) and movie 'pop' songs which completely take over the popular taste. Does Karnatic classical music, as we know it, even have a chance of survival ?

I think the answer is 'yes' - purely because it has survived and in fact, flourished the last several thousand years, like many other Indian traditions and institutions. Part of the reason for this resilience is that the Indian classical music systems are very adaptive - they change and rejuvenate themselves. If some of the Western ideas can be incorporated, they will be. Who knows, several decades from now, concepts like chords, polyphony or orchestration may be standard in Karnatic music.

The other reason for my optimism is that the Indian institutions always percolated down to the masses and touched them. I know I am treading controversial grounds. (Following Dr. RangaRamanuja Iyengar) The Vedas were too complex for the ordinary people. So its core principles were outlined in simpler works like the Epics and Puranas. While expert musicians dueled with each other in Royal courts, the masses sang Bhajan songs without

worrying about any musical intricacies. These days too while concert musicians play to packed halls in Madras, there is an overabundance of classical music being composed for the masses - movie songs and Bhajans - which are quite appealing and tend to 'hook' people to classical music. Composers like Ilayaraja and A.R. Rahman have composed many, many nice classical pieces which are every bit melodious as some of the ancient songs, even if they don't meet all the criteria for great classical compositions. If you take good, classical music directly to people, you are not going to lose!

We just cannot hang on to our past. We cannot go back to Gurukulam days. We cannot analyze Sa Ri Ga Ma in terms of horses and elephants. Let us learn more and adapt ourselves to the new and exciting things in front of us. And let us enjoy Karnatic music !

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## **APPENDIX I: SOME MELAKARTA RAGAMS AND THEIR DERIVATIVE RAGAMS**

### **Melakarta 8 HanumaTodi (popularly known as Todi)**

Derivative Ragams: Dhanyasi, Asavari, Ahiri, Punnavarali, Bhoopalam, Hindolam

### **Melakarta 15 Mayamalavagoulai**

Derivative Ragams: Bhowli, Malahari, Vasanta, Saveri, Nadanamakriya, Jagan Mohini, Goulai, Lalita, Sowrashtram.

### **Melakarta 20 Natabhairavi**

Derivative Ragams: Abheri, Ananda Bhairavi, Kannada, Jayantasree, Dhanasree, Darbari Kanada, Jonpuri, Bhairavi, Mukhari, Reetigoulai, Saramati, Hindolam.

### **Melakarta 22 Karaharapriya**

Derivative Ragams: Abhogi, Kapi, Kanada, Chandrakauns, Suddha Dhanyasi, Devagandhara, Darbar, Bageshwari, Brindavana Saranga, Madhyamavati, Sree, Sahana.

### **Melakarta 28 Harikambhoji**

Derivative Ragams: Atana, Khamas, Behaag, Kuntalavarali, Kurunji, Kambhodhi, Kadankuthoohalam, Chenchuruti, Dvijavanti, Tilang, Navarasa Kannada, Neelambari, Nattaikurunji, Bilahari, Mohanam, Sama, Surati, Valaji, Savitri.

### **Melakarta 29 Dhheerashankarabharanam (commonly known as Shankarabharanam)**

Derivative Ragams: Arabhi, Suddha Saveri, Hamsadhwani, Mohanam, Kedaram, Kurunji, Neelambari, Begada,

## **APPENDIX II: SUGGESTED LISTENING EXERCISES**

### **(1) Ramnad Krishnan; Vidwan Music of South India by Explorer Series**

In this CD, Ramnad Krishnan, a vocalist plays just about four pieces. This CD has a nice 'jacket' with a lot of notes written by Jon Higgins himself - they have even outlined the scales of the various Ragams used. See if you can identify the keys used in various Ragams. Among the Ragams chosen by Krishnan is Madhyamavati, a famous pentatonic Ragam. See if you can play it on the keyboard. For several mathematical reasons (the way the keys are arranged in the octave in specific ratios) this Ragam is supposed to sound unusually pleasant. See if you can relate to it. Krishnan plays Ragam, Tanam, Pallavi in Ragam Bhairavi. The CD jacket identifies the various components of RTP, such as Ragam, Tanam, Neraval, Kalpana Swaram and Tani Avartam. See if you can follow them.

### **(2) Irresistible; L. Subramaniam, Violin, Oriental Records**

This has a rendition of the very first Geetam anybody learns 'Sri Gana Naada' in Ragam Malahari. The second piece is a Varnam in Ragam Hamsadhwani in seven speeds. The Ragam, Tanam, Pallavi is in a Melakarta Ragam Simhendra Madhyamam.

### **(3) Jon B Higgins, Vocal, EMI**

The CD starts off with a Varnam in Ragam Bhairavi. See if you can identify this Ragam from Ramnad Krishnan's RTP in the same Ragam. This CD also has Thyagaraja's magnum opus 'Endaro Mahanu' in Ragam Sree. Jon Higgins also has songs in two Melakarta Ragams, Chakravaham and Pantuvarali (Pantuvarali is officially listed under the name Kamavardhini). He also uses another major pentatonic Ragam, Hindolam. Find out the notes of Hindolam and play it on the keyboard. It really sounds very pleasant and upbeat. Also, notice that Jon Higgins has used a variety of Talams, all the way from Adi to Roopakam to the Chapu Talams.

### **(4) Violin Virtuoso, Lalgudi Jayaraman, Violin, Oriental Records**

The artiste here starts off with a Varnam in Ragam Valaji and plays a song in a Melakarta Ragam Nasikabhusani. The Ragam, Tanam, Pallavi is also in the Ragam Simhendra Madhyamam. Can you compare this with the RTP played by L. Subramaniam in the same Ragam ?

### **(5) U. Srinivas, Mandolin, Realworld**

The Ragam, Tanam, Pallavi here is in Ragam Keeravani, a Melakarta. This Ragam differs from Ragam Simhendra Madhyamam only by the note Ma. (These two Ragams are 36 apart in the Melakarta sequence) Pay careful attention to the Ragamalikai section, in the RTP. There is also a song in another Melakarta Ganamurthy.